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Industrial Mobilization Planning Issue



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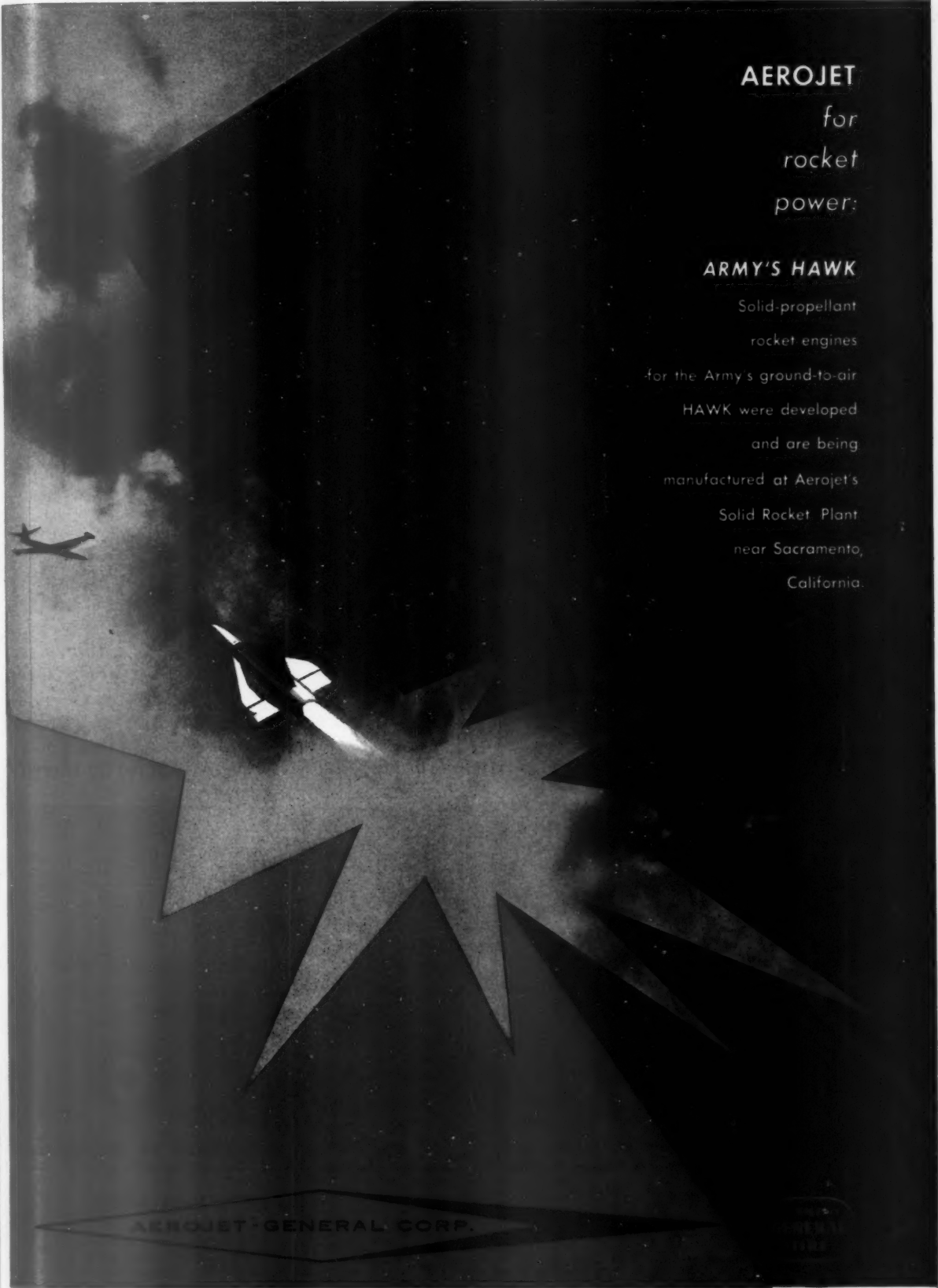
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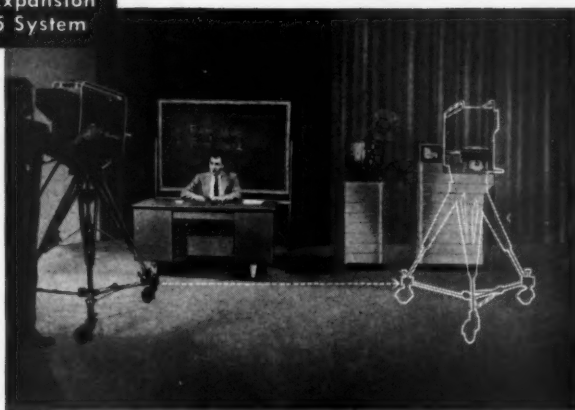
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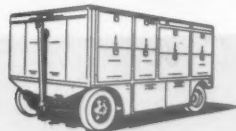


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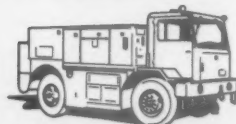
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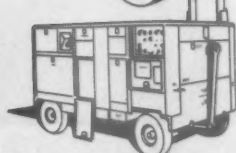
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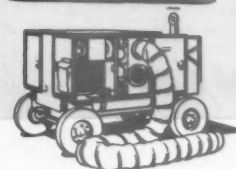
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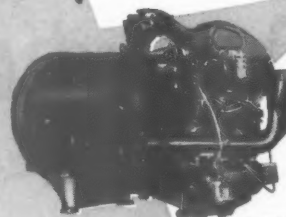


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PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS

JULY, 1958

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ARMED FORCES MANAGEMENT

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JULY 1958



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JULY 19

MITMA—Answer to the MATS hassle

THE Military Air Transport Service has been under the Congressional gun these past few months and it appears now that MATS is going to come out second best in its hassle with the commercial airlines. There is a strong indication on Capitol Hill that Congress is going to order MATS "to get out of the overseas commercial air carrier business."

Strangest aspect of all these hearings is that no one has brought up what seems to be the most logical solution to this whole problem—extending authority of the Military Traffic Management Agency from its present continental U.S. jurisdiction to world-wide control. Relatively young as single manager operations go, MITMA was organized in 1956, published its "rule book" of regulations in March of this year. One of its jobs is to recognize and exploit commercial carriers, land, sea and air, wherever this is advantageous to the military.

MITMA does not operate any carriers, is instead, as its name indicates, organized to handle *management* of the flow of military traffic. The advantages of extending its control area are many. Among them:

1—It would permit streamlining MATS and the Military Sea Transport Service into purely operational single managers;

2—It would put the control of all military transportation in a single office where primary concern would be efficient and economical transportation of itself, without any secondary drives to increase the importance or stature of a particular transportation medium;

3—MITMA could handle the increased administrative responsibility with only a relatively small increase in staff, allow MATS and MSTs to cut their administrative staffs to the bone;

4—It would help pull MATS and MSTs out of the political arena so they could get on with their jobs. (As they stand now, they are wide open to charges—easily made and difficult to prove one way or the other—of favoritism and "empire-building.")

Unless such a change as this is made, the Defense Department is leaving itself in position for another charge of bureaucratic duplication and single managers on top of single managers.

There is a rumor zipping around the Pentagon that

one of the study teams in the Office of the Assistant Secretary of Defense (Supply and Logistics) is evaluating just such a proposal as this. However, at this writing, it is not much past the discussion stage.

Although at this point it is probably the farthest thing from their minds, Congress may well force just such a move by getting tough with MATS. Whether they do or not, there seems to have been no sound argument advanced to date on why such an evolutionary solution should not take place.

Get Rid of Managers?

Col. William O. Davis, the Air Force rocket and space weapons expert, who quit the Air Force in a huff last month, let go a parting shot at what he termed the wide-spread reliance in the Defense Department on management as a specialty—"the principle that management specialists can manage everything." He said, to quote the *Associated Press*, that military research cannot necessarily be managed like a big business—"the man who runs a space program must know something about it."

The mileage that statement received in the press is unfortunate. First of all, it gives the management specialist more authority than even he would want to claim. Secondly, the real manager of any operation is the installation commander and, if he's smart which most of them are, he uses the management specialist as an advisor in the business and efficiency aspects of his operation. Third, it fails to recognize that the most effective of our scientific operations are, in fact, run like businesses—Huntsville, White Sands, Cape Canaveral, to name just a few.

Worse than all these, however, is the relegation of the word "management" to something odious, a feeling shared in the past by too many people working for the Defense Department. It is this very lack of respect for administrative responsibility in a military environment, holdover from World War II days, which has forced creation of the management "specialist" to do the job for the real managers, such as Col. Davis formerly was.

Bill Borklund

Is Military Equipment Becoming Too Complicated?

The more specialized military equipment becomes, the less industry can help shoulder the responsibility. It is time military businessmen took a hard look at a development preoccupation with "gadgets."

by H. J. Hunkele

Assistant Sales Manager
Engine Division
Caterpillar Tractor Co.

A RECESSION normally is popular with few people, but both industry and government leaders have recently become increasingly vocal on the benefits from a readjustment that forces a fresh look at the efficiency with which money is spent, and a general reawakening of cost consciousness. In times of unprecedented growth, it is normal for everyone to lose a sense of values to some degree, and it is accepted that current conditions make a good point for a pause and re-evaluation by business and government alike.

The government, however, particularly the military, is in the difficult position of having to expand our defense capability in the face of reduced tax revenues,—a situation aggravated by the necessarily fluid condition of our National Defense plans which quickly

obsoletes not only existing hardware but developing projects.

Considering the President's statement that the next war will be fought with hardware "in being" we are faced with the paramount problem of keeping our weapons systems up-dated at a cost that will not jeopardize our economy. These new weapons systems, intricate and complex as they are, require increased funds for research and development and commensurately expensive specialized facilities and tooling for production.

It is, therefore, particularly important right now that we look at the perimeter of these specialized items, for military requirements that can be satisfied adequately by commercially available equipment. There is a good reason to believe significant amounts

of money can be saved by increased emphasis on the use of commercial items of hardware and that a substantial portion of military procurement can fall in this category. Justifying this effort are a number of resultant gains which promote the country's welfare.

Commercial equipment can be built in existing plants, supported by the normal market, reducing the government's capital investment in specialized plants and tooling—with some planning, military orders can usually be phased in and out of regular production with minimum expense and labor dislocation.

The use of standard or mildly modified commercial equipment takes advantage of the "latest state of the art", advanced by the research and development supported by industry. The mili-



Need for public acceptance leads to simplicity of operation. Example is modern heavy-duty equipment which can be operated by unskilled labor such as these three natives from Nairobi, Kenya, British East Africa.

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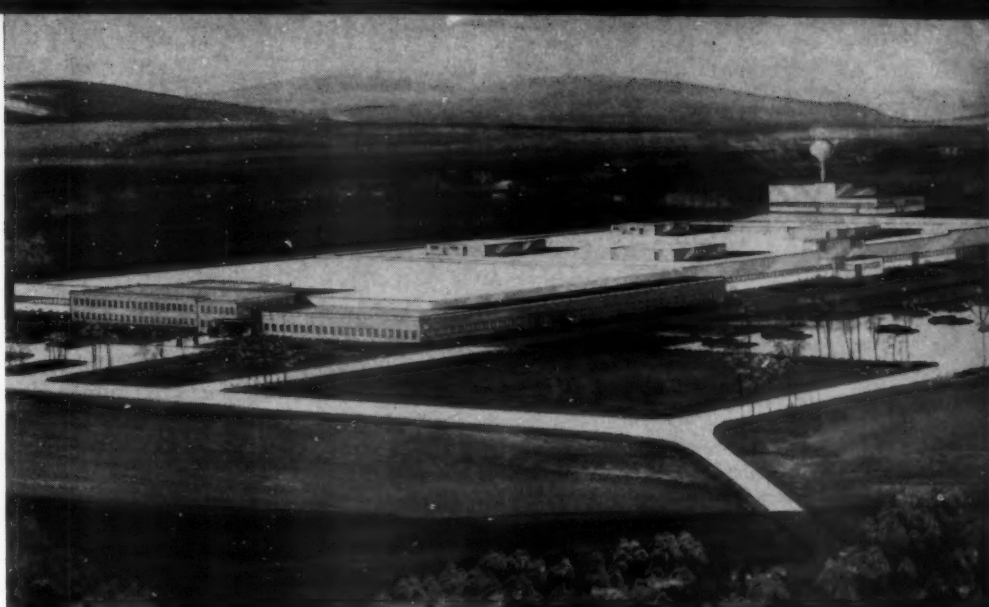
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To back-up National Defense, industry must keep faith in U.S. economy, in spite of recession. Now under construction at Mossville, Ill., is a new 12-acre Caterpillar engine plant shown here in artist's conception.



tary would find it expensive and time consuming to develop comparable proven quality by starting from "new center lines."

Commercial items in the main, have been proven by the best proving ground in the world—the critical using public. With our world markets, American machinery is used from the tropics to the arctic in all types of severe service, often with only nominal maintenance. Equipment with this proven acceptance is available to the military at posted competitive prices.

One of the biggest logistics problems of the services is that of parts support. The more specialized military equipment becomes, the less industry can help shoulder the responsibility for parts backing. Commercial items have their parts support maintained and fi-

nanced by the using public, reducing the tremendous investment in inventories by the services. Many companies make their parts available to the government through their dealers by G. S. A. contracts to further reduce inventories.

Commercial equipment has better resale value than specialized military equipment, permitting the government to rotate their depot stocks to up-date them at lower over-all cost.

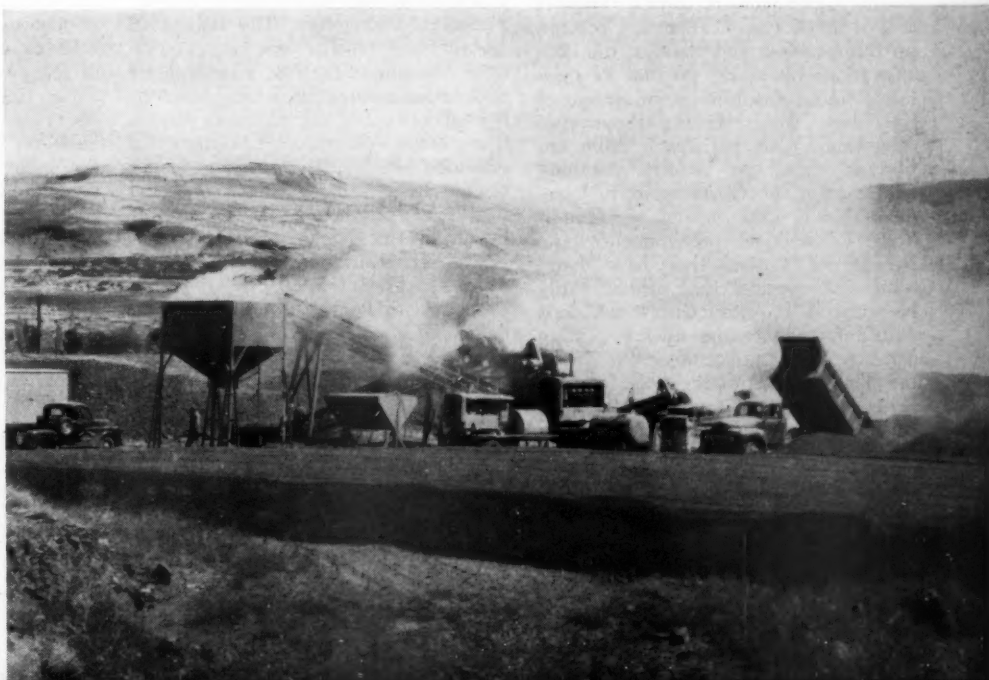
As military equipment becomes more complicated, adequate maintenance becomes an increasing problem. Considering the necessary rotation in military personnel, commercial items have the added advantage of being more easily maintained by average personnel with limited training. As a by-product there is less downtime from equipment dead-

lined and fewer total number of equipments required.

Looking at the rapidity with which weapons systems become obsolete, cost becomes increasingly important and the possible adaptation of major components to newer systems becomes a valuable consideration. Commercial equipment by its very nature is usually designed for flexibility and lends itself to up-dating and modification. It must under the inherent characteristics of a competitive market.

Acknowledging that our greatest asset lies in our free enterprise system, we can strengthen that system, and our national productive capability to compete in world markets, by having our government support commercial industry by procuring as many of their standard products as possible.

The surest of all proving grounds, their jobs, prove equipment design better than any testing or proving ground operations.



Poor Planning, Bad Habits, and Small Business

by Harry B. Yoshpe
Historical Research Officer
Office, Army Chief of Transportation

IN THE mobilization of the Nation's resources for defense and war, few problems have proven more thorny than that of harnessing the productive potential of small businesses. Many such plants have the resources and managerial talent required to convert to defense production. Many more can make their best contribution by helping to meet the irreducible needs of a sound supporting economy.

Deep cuts in normal lines of work, however, sap the lifeblood of thousands of small businesses; and unless the opportunity is afforded them to participate in defense and essential civilian production, they face inevitable shut-down, idleness and disruption of their organizations. To some extent, the exigencies of defense and war must take their toll of businesses as they do of human lives in combat. The indications are clear, however, that well-considered and timely arrangements can go far to effect the necessary adjustments without costly dissipation of vital productive capacity and with minimum distortions and damage to the national economy both in war and its aftermath.

Sound Procurement

The experience of World War II and of the Korean Conflict has pointed up this problem and some of the considerations that must go into its resolution in any future mobilization of the home front. Among these considerations, none perhaps is more important than the orderly planning and conduct of Government procurement. Under defense and war conditions, Government procurement starts streams of actions that have long-term consequences that cannot easily be retraced. It brings with it decisions with reference to the use of existing capacity, the building of new facilities, the flow of materials, tools, components, manpower and services. If badly managed, Government procurement not only increases costs, but has disruptive effects on the national economy. In these circumstances, it is impossible to get the most out of

the Nation's resources, and greater dependence must be placed on supporting stabilization and industrial production controls.

No such considerations had entered into Government procurement in the two decades of peace preceding World War II. Procurement officers were generally restricted by law to the formal-advertising method of contracting. With Government requirements small and supply sources ample, purchasing under this time-honored policy was largely reduced to a routine, mechanical operation—soliciting sealed bids and selecting from a wide market contractors best able to perform at the lowest cost to the Government. In the event contractors were unduly delinquent, their production could be terminated, and favorable market conditions, as well as appropriate penalty clauses in contracts, were adequate to safeguard the Government's interest.

Under defense and war conditions, this leisurely, routine approach had to go by the board. The price factor remained important, but it became secondary to the basic objective of effective prosecution of the mobilization effort. Supplies had to be obtained in a market that was to lose its normal characteristics. The impact of mobilization on the economy, moreover, brought to the fore a multiplicity of new considerations which contracting officers could not afford to ignore. The scope of these considerations extended beyond the formal mechanics of purchasing, embracing such vital details of production as the use of facilities, critical tools, materials, manpower, transportation and a host of other pertinent factors. To insure proper consideration and intelligent balancing of these novel factors in the exercise of their contracting responsibility, procurement officers were vested with the negotiating authority.

Procurement officers were slow, however, to approach their task and exercise their broadened authority with the imagination and daring required under the changed conditions.

There should be no need for special agencies to champion the cause of small business. It is time for Government procurement agencies to shed ingrained habits which militate against small plants. Here's why . . .

In the feverish rush and excitement that marked the Nation's rearmament, it was natural that contracting officers should have looked askance at some of these new factors in contract placement and at public, congressional and civilian mobilization agency pressures for appropriate attention to these matters. Every consideration other than the ability to perform at the lowest cost to the Government was viewed as sheer politics, and there was no small reluctance to burden the purchasing job with broad ideological and other principles that might hamper the responsive supply of troops.

In time, however, it became evident that these novel factors in contract placement made good sense all around. Concentration on a small number of low-cost suppliers might not only prove injurious to the small business structure of the Nation, but it might impair war production itself. The demands on industry became so heavy that it was absolutely imperative to broaden the production base, and the wider dispersion of orders consequently assumed an importance that went far beyond political or sociological considerations. The appearance of congestion and labor shortages in many areas indicated the folly of continuing to place orders with little or no regard to the availability of manpower. It required little imagination to appreciate the wisdom of reserving the capacity of specialized firms for research and production on the more complicated munitions and contracting with the smaller manufacturing units for the simpler civilian-type items. In the face of the many uncertainties of production under emergency conditions, the danger of putting all one's eggs in one basket came to be more fully realized.

Obviously, these contract-placement factors always had to be subordinated to the basic objective of securing performance at the time, in the quantity, and of the quality required by the Armed Forces. But as the mobilization program mounted in scope and intensity, it became clear that there

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was far less conflict between these objectives than was originally thought. In giving proper consideration to all these factors—speed of delivery, fairness of price, availability of labor, avoidance of undue geographic concentration of contracts, utilization of small plants, resort to subcontracting and in-plant training of workers, discouraging unnecessary plant expansion, avoidance of wasteful transportation practices and of congestion of warehousing facilities, conservation of special abilities, and the like—contracting officers were in a position to contribute materially not only to the winning of the war, but also to the reduction of the strains and dislocations which inevitably were felt on the economic front.

The Record

The task of fitting the Nation's smaller facilities into their proper niche in a war economy posed vast and complicated problems. In World War II, this Nation never adequately came to grips with these problems. Prewar plans gave slight recognition to the productive potential of small plants. Procurement agencies long neglected the smaller firms, and the civilian mobilization agencies could do little to check the high degree of concentration of war orders in large corporations. Smaller firms were drastically restricted in their attempts to supply civilian products, but no well-conceived orderly plans were devised for their integration in the war-production program. Administrative mechanisms and programs to afford small plants greater opportunities in war production were slow to take shape and were none too effective at best.

In their emphasis on getting out the contracts, loading up industry and getting started on the job of expanding capacity and tooling for production in large quantities, the procuring agencies rapidly erected the foundations of a vast munitions industry. This was accomplished, however, without proper regard for the need for a broad production base and reducing the impact of the defense program on the civilian economy. Large firms employing over 500 workers, which in 1939 constituted 1.3% of the industrial establishments and accounted for 38.4% of the Nation's industrial output, produced somewhere in the neighborhood of 70% of the total munitions in World War II. On the other hand, the smaller plants, which made up 98.7% of the 184,230 industrial enterprises in the country and produced approximately 61.6% of the \$56.8 billion output in 1939, accounted for somewhat less than 30%

of the total munitions production, including both prime contracts and subcontracts at all levels.

What portion of the capacity of small firms could have been converted to munitions production has never been determined, but it is generally conceded that small concerns were not utilized to their fullest possibilities. The disproportionate emphasis on large plants was accompanied by unnecessary plant expansions, delays and bottlenecks in production, heavy migration of labor from nondefense areas, serious congestion and community problems in centers of defense concentration, needless strains and distortions on the economic front, an accelerated trend toward economic concentration and a threat to the free-enterprise system in the postwar period.

We profited little by this experience in mid-1950, when once again this

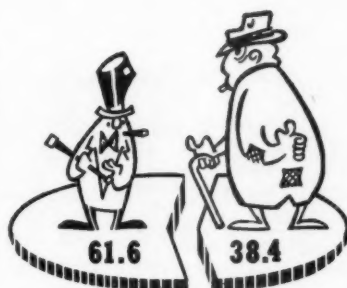
100 largest manufacturing corporations in the United States.

Highlighting the Korean emergency experience, the official history of NPA's Office of Small Business had this to say in the way of criticism:

"There was a tendency, perhaps understandably so, to ignore or at least to 'play down' the position and problems of small business amid the fast moving programs of material control and of industrial expansion. The smaller manufacturer was too frequently regarded as unsuited for and unimportant in the vast scheme of defense production..."

To those who might again be called upon to guide the operations of an industrial mobilization and material control agency, it had this "one basic recommendation":

"At the outset the problems, position, and productive poten-



Percentage of Industrial Output Before World War II

Nation embarked on a vast rearmament program to meet the immediate needs of the Korean outbreak and the threat of Communist aggression on a global basis. In the development of the Defense Production Act of 1950, the Congress made specific provisions for the protection of, and participation by, small manufacturers in the programs required to strengthen the security and defense of the country. Repeated pronouncements and regulations of the delegate agencies outlined the necessary consideration for small business as a part of the strategy of the defense mobilization program. Yet, in the striking buildup of the mobilization base, the Nation again saw a heavy concentration on the facilities of big business. In the heavy outpouring of military contracts in the first six months of the Korean fighting, only 21.3% of the total dollar volume went to small plants. Of over \$4 billions worth of tax amortization certificates granted as of March 23, 1951, approximately 50% went to 42 of the



Percentage of Munitions Production During World War II

tialities of the 230,000 or more small manufacturing concerns should be recognized as an important economic, as well as production, factor rather than as a group representing a convenient political or emotional pawn... The need for, the expense of, and the administrative difficulties resulting from the creation and operation of a separate small business agency—SWPC during World War II and SDPA under the Defense Production Act of 1950, as amended—arise only through failure to forthrightly provide for the situation in basic legislation and the aggressive action by the primary agency which would result therefrom."

Effective Mobilization

A review of the experience of the past points up the urgency of advance planning in peacetime, and some of the most promising lines of such planning for the full and effective use

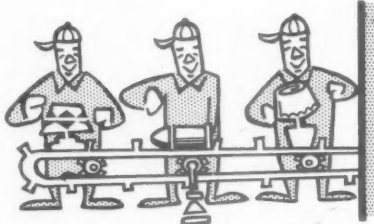
of small business in munitions and essential civilian production. Of primary importance is the need for a comprehensive, current and readily usable inventory of the capacities of the small producing units. At no time during World War II was it possible to state with any degree of accuracy how many of the Nation's total manufacturing establishments could be used effectively, in whole or in substantial part, for defense purposes. In the military services and the civilian mobilization agencies as well, it was generally believed that only a minor fraction of small plants, confined largely to the 28,000 metal-working industries, were adaptable to munitions production. Those specifically charged with the responsibility for small-plant mobilization were more optimistic, their estimates of convertible plants ranging from 45,000 to 58,000. Without specific, current data on the location, management, engineering, financial status, tooling and capacity of the Nation's industrial plants, it was impossible to develop a sound program for fitting small facilities into the war effort.

In the absence of dependable facilities data, the feeling was widespread that small plants could not be drawn into the mobilization effort. Yet, repeatedly small plants demonstrated a high degree of flexibility and adaptability to the production of munitions. Such conversion was not confined to the metal-working plants, but ran the gamut of the entire industrial structure. The records of SWPC are replete with cases of radical conversion by small facilities. Furniture manufacturers, for example, turned their energies and resources to the production of wooden cargo bodies and magnesium bomb noses. A cosmetics plant shifted to the splitting of mica for electric condensers. A supplier of cube steak machines and french fry cutters turned to metal armament parts and rigging work, based on wire rope and splicing. Manufacturers of women's wearing apparel and chenille bedspreads converted to the production of bomb parachutes. Similarly, ladies' hats gave way to haversacks and Navy hammocks; tobacco pipes to steering engine parts for ships; builders of wood materials to ammunition crates and shell boxes; paint cans to jigs and fixtures; electric heating pads to jungle ponchos; permanent waving machinery to tools, jigs, dies and machine parts; umbrellas and awnings to duffle bags, canvas cot covers, and parachutes for 23-lb. fragmentation bombs; lamp shades to medical supplies, switch boxes and bomb fragmentation parachute assemblies; and cigarette and vanity cases to incendiary bombs, ro-

tating bands and ammunition containers.

With appropriate guidance and some engineering assistance, such conversions have been, and can again be, effected to the benefit of the war effort and the economy as a whole. With the set-aside of minor quantities of critical materials for them, small plants that cannot be converted can render vital service in essential civilian and defense-supporting activities. With firms thus playing their appropriate roles in basic defense and civilian production, few indeed need close their doors for the duration or find themselves permanently disabled.

Because small plants have their place in a war economy, responsibility for their effective use should have been shared by all departments and agencies, civil and military, whose activities bore on their problems. It was the public and congressional impatience with the fumbling and ineptitude of the mobilization agencies on this score which led to the creation of SWPC in World War II. Much the



Versatility

same experience in the Korean crisis prompted the establishment of SDPA. There should have been no need to set up agencies specifically for the purpose of championing the cause of small business, with the implication that everyone else had to be needed or badgered into acceptance. As long as it was the expressed policy of the Government to make full use of facilities of small business in defense and war, all agencies should have been made responsible and held accountable for the effective implementation of this policy.

For their part, Government procurement agencies must be prepared to shed ingrained habits of thought and practice which militate against the wide diffusion of contracts to smaller plants. Psychological attitudes, policies and organizations developed over the years had made procurement officers reluctant to do business with other than the largest, experienced, and most responsible concerns. Unaware of the productive capacity and adaptability of many small concerns, they were haunted by the fear that their use might retard pro-

urement. To the procurement officers, these small facilities were like "babes in the woods" that would have to be given "personalized service" if they were to perform satisfactorily on their contracts. Few such firms had previous experience with Government work, and a tremendous educational job was involved in getting them to realize the importance of full compliance with specifications and contract requirements. Many lacked funds or credit, adequate plant supervision, or proper cost accounting and inspection methods. Their operating and managerial personnel would have to be retrained and their business methods and packing, marking and crating practices readjusted to bring them into line with government standards. Small wonder, then, that contracting officials, conscious of their responsibilities for the expenditure of appropriated funds and for getting timely production of acceptable supplies at the lowest cost to the Government, were loath to gamble on unknown suppliers.

The difficulties which procurement officers saw in dealing with small plants were often far from imaginary. They were, however, the result of long neglect of small plants in Government procurement. In peacetime, under normal conditions, few small plants showed much interest in Government orders. With the depression of the 1930s and the initiation of defense preparations at the close of that decade, interest in Government business became more widespread. It was almost impossible, however, for small plants to hurdle the many barriers in their way. They could not afford to maintain representatives in Washington or in distant central field procurement offices to solicit orders. The shortness of time allowed for the return of bid invitations made it impossible in many instances to make proper estimates for the submission of bids. Specifications, drawings and plans were not always available in sufficient time to permit adequate study prior to the submission of bids. In many cases bid information and the specifications were so inadequate in detail that it was impossible for any but previous suppliers to bid on requirements. Failure to bid on several occasions would result in the dropping of potential suppliers from the bidders' lists, even though the above-mentioned difficulties might have been responsible for such failure.

Though authority was granted in an act of July 2, 1940 to depart from peacetime procurement methods whenever necessary to expedite the national defense, the policies pursued were far from those contemplated under the prewar procurement plan-

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ning program. Formal advertising and competitive bidding persisted; orders were placed without regard to the "allocation boundaries" worked out for the various services; and the whole system of M-Day procurement based on "schedules of production" signed by allocated facilities within the districts became overlaid with a conflicting pattern of current orders. Much the same experience was repeated with the launching of the Nation's rearmament program following the outbreak of the Korean War.

Even following the scrapping of the formal advertising method in the spring of 1942, the negotiating technique was not always used with the degree of flexibility contemplated and required for the most effective prosecution of the mobilization effort. Fearful of criticism or of charges of favoritism, procurement officers were reluctant to employ the negotiating method on a basis other than the solicitation of informal bids or quotations and award to the lowest responsible bidders. In these circumstances, it was difficult to achieve a proper consideration of the various factors other than price prescribed for guidance in contract placement.

Bid prices of small plants, experience indicated, often yielded important savings to the Government. Contrary to prevailing opinions, even imbedded in legislation authorizing price differentials, there was no inevitable correlation between plant size and unit costs which found their translation into bid prices. In one case, a saving of about one and one-half million dollars was effected by arranging the placement with smaller plants of a portion of a large procurement of insect repellent by the Quartermaster Corps, simply through the process of inducing reductions in the bid prices paid to all suppliers. Similar cases occurred in the procurement of chemical kits, field sterilizers, screw drivers, coupling gaskets, goggles for fliers, electric heaters, relays, bins, shelves and body assemblies, shock absorbers, photographic trimmers, cameras and other items. The payment of price premiums to small plants was permissive and not mandatory, and was rarely invoked. Where allowed, the savings in otherwise needless expansion of facilities at Government expense, either directly or through tax deductions, were believed to have more than equalized the account from the standpoint of the public.

The conglomerate pattern of procurement offices, with considerable shifting and compromise between centralization and commodity specialization on the one hand and district or geographic lines of organization

on the other, added to the harassment of small plants in their quest for defense orders. Centralization and commodity specialization of procurement organization were most generally used because these forms clearly had many advantages in terms of economy and effective control. This organization pattern avoided costly duplication of research, engineering, technical, procurement, legal and administrative staffs. Uniformity of procedures was insured. Centralized procurement minimized the problem of coordinating results of negotiations at various points, and avoided interference in the market by the solicitation of quotations from different purchasing agents.

Strategic and contract dispersal objectives, however, were not best served by centralized procurement organizations. The concentration of facilities and trained staffs at single points, whether in Washington or in the field, hardly provided the "reserves" so essential in the event of disruption by enemy attack. Centralization brought with it, too, a concentration of "know-how," with an attendant reluctance to entrust the contract placement job to district representatives closer to the points of manufacture. Inevitably, with "commodity" procurement depots located in close proximity to the area of greatest concentration of the particular industries, contracting officers tended to place orders in their own "back-yard." Small plants distant from central procurement points often found themselves at a distinct disadvantage in obtaining quotations and samples, in estimating costs, in sending in bids, and in resolving questions incident thereto. Centralization further was conducive to long hauls and unnecessary expense in distributing items from manufacturing plants to storage points.

Even under the pressures of emergency and war conditions, however, much was done to cut away the brush in the Government procurement jungle and to facilitate a greater spread of the defense load. Large orders were broken down to permit multiple awards. In some cases, distributive buying, with "intraregional" rather than nationwide bidding, permitted the introduction of qualified manufacturers previously handicapped by higher operating costs. A number of "distressed" or "labor surplus" areas were relieved by according them preferential consideration in contracting. More time was given for the notification of procurements and for the submission and inspection of bids. Requirements for the posting of performance bonds were made less rigid. Financial aids, through assignment of claims under contracts, through advance, partial and progress payments,

through bank loan commitments and guarantees, and through special credit extension by Federal lending agencies, helped small plants to follow through on going contracts and to prepare for further orders. Satisfactory arrangements were ultimately effected for the advance planning of procurements and for the reservation of appropriate items or quantities for production by the smaller units. Though the results fell short of the objectives, significant gains were made in subcontracting by encouraging the "farming out" or "exploding" of appropriate items and the pooling of satellite facilities under "parent" plants for the production of "bits and pieces."

A number of these emergency and wartime changes have been made standing operating procedure in the current scene. In close working partnership, the civilian and military agencies concerned can plan further to remove such obstacles as remain to block the effective mobilization of small plants. Together they can develop and maintain a thorough inventory of America's plant and machine capacity. Procurement policies, organizations and procedures can be further adjusted for effective responsiveness to the needs of war. Ways and means must be found to insure the more widespread use of subcontracting. Proposals for facility expansions must be more closely scrutinized and controlled to insure full use of open capacity in existing plants. Plans can be laid for the formation and use of industry pools with responsible management and financial standing and keyed to the production of specific classes of items needed in the mobilization program. Financial aids and engineering services to small plants can help them in taking on war work, in handling subcontracts, or in converting to essential civilian production. Promotional activities, including "clinics" and exhibits, guides to procurement offices, and detailed shopping lists, can help small plants to know the requirements of the Armed Forces, to establish the necessary contacts, and to figure out whether they can contribute to the meeting of military needs.

There is much background of emergency and wartime experience, both good and bad, that bears intimately on all of these program elements. The record of this experience should be reviewed critically by those now charged with planning for the future. The mistakes, the faltering steps and the successes of the past can all be put to profitable use in coping with the problems of how best to help small business make its necessary contribution and weather the storm and stress of defense and war.

Each year over 120 senior officers, drawn from important commands throughout the world, spend 10 months becoming experts in the economic aspects of national defense. Place is the Industrial College of the Armed Forces. This is . . .

How the Joint Chiefs Train Future Military Businessmen

by Lt. Gen. George W. Mundy,
USAF

Commandant, Industrial College of the Armed Forces

ONE of the most interesting phenomena of military Washington occurs in August of each year, when over 120 senior officers, drawn from important commands throughout the world, are thrown together on the third floor of an outdated temporary building and find themselves in command of nothing but themselves. These men have 10 months to become experts in the economic aspects of national defense, a subject broad enough to demand a rigorous program of research and study for a full academic year. The scene of this activity is the Industrial College of the Armed Forces, Washington, D.C., one of the two highest educational organizations in the Department of Defense.

The Industrial College is a military organization—it is under the direct

control of the Joint Chiefs of Staff—but the school fosters a spirit of academic freedom more than of strict military discipline. For most students, steeped in the "team-effort" tradition of military operations, it is a sudden transition to find themselves in an educational atmosphere where results are achieved primarily by individual ability. "Last year I had a staff of four specialists who performed all my research and wrote all my reports," one Army colonel in the present class said. "Here I start from scratch and build my own projects from the ground floor up. It's an exceptionally valuable experience."

Most of the students seize the opportunity for individual expression afforded at the Industrial College and work intensely, often on their own

time. Doubtless there are some phases in a complete research plan which senior officers might wish they could pass on to some second lieutenant on their staff—but no such staff is available. "There are a lot of frustrations in this kind of work," one student remarked, "especially when you spend hours sifting just one fact out of a pile of reference material. But the end result is more than worth the trouble. It is the only way to learn a subject thoroughly."

Last year when the Russian Sputniks went up, Americans from all classes and all walks of life took a sudden interest in the way our national defense program was being handled. Since last fall the front pages of our newspapers have carried an astonishing array of articles on the state of



From two angles, camera catches Ben Chapple, executive vice president of U.S. Steel, lecturing to one of the Industrial College classes.

ARMED FORCES MANAGEMENT

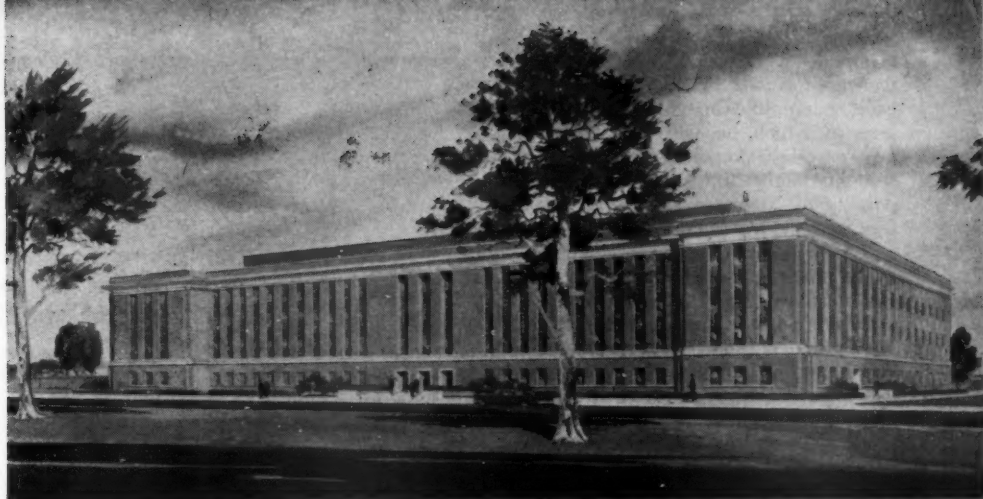
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Now housed in one of those monstrosities called a Temporary Building, Industrial College will soon be in this new \$4-million building on which Army Engineers recently completed detailed blueprints.

our basic research, the organization of our military forces, the size of our defense budget and the inadequacy of our educational system. From the point of view of the Industrial College this sudden burst of interest means that the subjects the College has been pursuing for years have finally come into prominence in the public eye.

Notice how the regular schedule of the College matched with the firing of the Russian satellites last year. Within a week after Sputnik I was launched, Mr. Lloyd Berkner, President of Associated Universities, Inc., told the students exactly what the scientific significance of the Russian feat was and where we stood in our comparable program. Two weeks later the students worked with a panel of missile chiefs from each service: Maj. Gen. John B. Medaris, USA; Maj. Gen. Bernard A. Schriever, USAF; and RAdm. John E. Clark, USN. Shortly after that, the class flew to Cape Canaveral to pat Thor and Jupiter on the back and to observe the various launching and guidance facilities there. Back at the College they heard a lecture by missiles expert William M. Holaday, and visited the Glen L. Martin Company in Baltimore to observe the production details of the Vanguard rocket.

The research and development of guided missiles and rockets is but one important phase of the course at the Industrial College, which concentrates primarily on the economic capability of this country to maintain its position in the present international struggle for power. The students, including some 20 top-ranking civilians from Federal agencies plus the military officers in the class, have at all times three general objectives in view:

1. To analyze the methods by which the civilian economy supports our military forces.

2. To project plans for maintaining a constant state of national preparedness.

3. To compare the industrial and technological strength of the Free World with that of the Soviet bloc, considering in this comparison the implication of gaining or losing the allegiance of the uncommitted areas of the world.

A remarkable number of related topics are involved in pursuing these three goals. For instance, midway in the course the students spend one month on the subject of human resources. This part of the course naturally focuses on the sources, requirements and utilization of manpower in industry and the Armed Forces. But to obtain complete knowledge of the subject the students must also investigate the many controversial problems of education facing this country. Further, several days are spent on the history of the labor movement and the effects of labor-management relations on national defense. An international context is provided by a study of comparative national cultures and population problems in the rest of the world. Needless to say, at each step the human resources of the Free World are compared with those of the Soviet bloc.

The study of human resources is but one of the nine successive units which make up the Resident Course at the Industrial College. When one considers that each unit branches out into such varied topics as described above, it becomes evident that some unique educational methods must be employed to cover this volume of material in one year. Here is where the individual abilities of the students come into play. One hundred and forty-five senior officers and government officials can produce in 10 months a remarkable amount of valuable in-

formation to each other's benefit. If the results of each student's research can be conveyed to the rest of the class, the problems of covering a broad subject in a short period of time disappear. A glance at some of the details of the course will show how this unique program works.

Each student selects an area in which he writes a thesis during the year. The thesis is a wholly individual and original essay based on each man's personal knowledge and his research in the College library or in one of the other excellent libraries in Washington. Each year the College publishes about 20 theses and distributes them to interested Federal agencies and military commands throughout the country. Copies of all theses, either in published or typed manuscript form, are kept in the College library for use by the other students and for succeeding classes.

Each student must also deliver a lecture to the rest of the class, usually on a subject outside his thesis field. In addition to creating another way by which an individual's findings are passed on to the class, these oral presentations enable the student to develop his speaking ability and platform presence. As an "extracurricular" supplement to this program, two visiting professors conduct a complete public-speaking course for the class during the school year.

Much of the College program is carried out in an intricate system of committee work, which again depends on individual study despite its appearance of group effort. For instance, in the spring of each year the class spends a month studying Free World and Soviet economic capabilities for war. Eight committees are formed, each consisting of 15 to 20 students and a faculty moderator. Each committee writes a detailed report discussing the

economic aspects of a hypothetical war with Russia. To accomplish this, each committee member selects an area in which he will carry out his own research program. Two or three students might study the economic capability of Russia in this hypothetical war, while others would work on China and Communist Asia. Another group would investigate the potential of the United States or perhaps such areas as Western Europe or the Middle East. This research phase lasts about three weeks and is augmented by seminar meetings with members from the other committees who are studying in the same area. In the final week of the unit the students meet again in their original committees and consolidate their research into an extensive written report on the overall subject.

These periods of individual and committee work are supplemented by daily lectures given by experts chosen from the fields of industry, government and education. These lectures form the most engaging part of the course at the Industrial College, for the speakers are selected on the basis of their willingness and ability to present an honest picture of our national defense effort—the story behind the newspaper articles and television interviews, so to speak. At the end of each lecture the students have an opportunity to fire their questions, comments and contradictions at the speaker. The spirit of controversy sometimes reaches surprising heights in these question periods, because both the speaker and the audience usually have strong opinions on each point discussed.



Industrial College Commandant is Air Force Lt. Gen. George W. Mundy.

These are the ways in which the Industrial College provides a thorough education in the economics of national security for carefully selected senior military officers and Government executives—the men who soon after their 10 months of study will return to active participation in leading this country's constant effort to maintain international supremacy.

The results produced in the Resident Course have reached such importance that the Joint Chiefs of Staff have authorized the College to conduct two programs which reach out to other interested people throughout the country. Traveling teams of faculty members present National Resources Conferences in 12 cities each year. These conferences, which consist of two weeks of lectures and group discussions on current economic problems,

are designed to reach business and civic leaders and reserve officers in each of the selected cities. The second extension program is a correspondence course, "The Economics of National Security," which is unequalled in its scope and presentation. The resident faculty at the College has written 22 textbooks which comprise the reading material of the course and which are sent free to all enrollees. As he progresses through the books, the correspondence student takes periodic examinations prepared by the Educational Testing Center of Princeton, N. J. The course is difficult—the College would have it no other way—and usually requires about a year to complete. These two extension programs have now reached nearly 60,000 persons, a total rapidly expanding. The National Resources Conference and the correspondence course represent an outstanding effort on the part of the Armed Forces to keep American citizens aware of the latest developments in planning for national security.

But the very basis of this expanding activity at the Industrial College is still individual initiative and ability. The extension programs rest on what the faculty members themselves produce. And the Residence Course depends on the success of the student's own programs of research and study. Individual creativity is the very essence of an educational organization, and the Industrial College of the Armed Forces offers proof that this fact is just as true in higher military education as it is in our civilian universities and colleges.



Small group discussions, such as this one involving Henry Kaiser (center) of Van Arkel and Kaiser, are an important part of College curriculum.



Washington Background

AMONG THE KNOTTY PROBLEMS discussed at the Secretary of Defense's conference in Quantico, Va., the last week in June was what to do about the Air Defense setup. Question revolves around a dilemma familiar to the members of the Joint Chiefs of Staff who were there, i.e. how much of what is enough? If the serious thinking jells soon, look for a consolidation (under the banner of "streamlining") and greater unification in such unified (on paper but not in fact) operations as NORAD.

FEELING IS GROWING IN WASHINGTON that Eisenhower's Defense Reorganization "battle" is turning into a wishy-washy farce. House, by a 402-to-1 vote, blew large holes in a Presidential attempt to amend their reorganization bill—a bill which leaves enough loopholes in the original Eisenhower proposal to negate most of its value. Main reason for the defeat seems to be White House threw out a great deal of heated conversation, coupled it with little action in bucking for a change.

EXTREMELY BAD ASPECT OF ALL THIS is that Pentagon personnel, to whom reorganization may mean their jobs, now have no guidelines to follow. Pentagon is making valiant attempts to incorporate the Eisenhower ideas which require no legislation. But the major changes require legislation to make them effective. White House says they will be forthcoming. Congress does just the opposite—and gets away with it. Unless reorganization acquires some firm hand to guide it, the present confusion will multiply, create a situation far worse than whatever might have existed under the old organization.

NOR IS THERE ANY SIGN the confusion will abate. Senate is moving very slowly in its reorganization discussions and year-end elections are approaching. At the present erratic snail's pace, there is an excellent chance you will see nothing but organizational chaos and uncertainty in the Pentagon until possibly 1959.

PENTAGON INFORMATION POLICIES are getting in more and more trouble. House Information Subcommittee, headed by Rep. John Moss (D-Calif.), let go a particularly strong warning that unless the Pentagon itself reverses its policies on releasing information Congress would have to pass major legislation guaranteeing the public's right to know. The proposed Pentagon central information plan, said chairman Moss, could lead to the Pentagon's speaking with only one voice—"the voice of a politically appointed propaganda expert" with "immense personal powers to decide what the American people may be told about their own dearly-bought security."

CHARGE OF "EMPIRE BUILDING" has already been hurled at the Public Affairs setup as a result of Defense Secretary McElroy's creating a new Office of Plans and Programs (headed by Army Engineer Col. Robert F. Seedlock) reporting to the Assistant Secretary of Defense for Public Affairs "to assist in assuring integrated planning of implementation of public affairs activities of the Department of Defense, including the military services."

MILITARY LIFE IS DUE for some marked changes soon if the House Appropriations Committee has its way. It went on record, a little over a week ago with:

1—The ratio of officers to enlisted men is too high and should be brought into more "realistic" balance;

2—The services should cut down on proficiency flying, especially for those who are desk-bound;

3—The role of the Navy's super carrier "must be restudied in the light of changing concepts of modern warfare;"

4—There are still too many permanent changes of station and too much temporary duty travel in the Services;

5—More military dependents should go to military hospitals for medical care with less use of civilian facilities.

Polaris Nose Cone In Advanced Stage

Development of a highly refined nose cone for the Navy's fleet ballistic missile, Polaris, has been revealed by Rear Adm. William F. Raborn, chief of the Navy's special projects office.

"The nose cone design for the Polaris has now reached an advanced stage of development after numerous proving flights on Lockheed X-17 rockets (nicknamed the 'Polaris, junior grade' by missilemen)," said Raborn.

Lockheed, missile system manager and prime contractor for Polaris, has revealed the solid fueled "Polaris, j.g." has compiled a 100 per cent reliability record in its Navy program.

Nuclear Engine Test This Fall

The first test of the nuclear rocket engine, dubbed KIWI I, will be held at Jackass Flats, Nevada, early this fall, according to Norris E. Bradbury, director of the Los Alamos Laboratory. The gas-cooled engine is not intended

to fly. A second gas-cooled nuclear rocket engine, named Dumbo, will be tested at a later date. It will use different gases than those used to cool KIWI I.

Purpose of the tests is to determine cost feasibility of nuclear rocket plants. Operating temperatures of the rocket engines will be relatively low in the initial test and will probably be increased as the test program continues.

Honeywell Claims EDP Breakthrough

Discovery of a method to insure virtually uninterrupted accuracy in electronic data-processing by correcting mistakes "on the fly" at electronic speeds has been claimed by the Data-matic Div. of Minneapolis-Honeywell.

The new system, called Orthotronic Control, literally re-creates source data by a form of electronic detective work and provides instant data reconstruction of lost or garbled words or figures when discrepancies are automatically spotted at any one of a series of check points throughout the system.

Air Force Testing Mace Guidance

Air Force is test flying its TM-76 Mace at Holloman Air Force Base, New Mexico, to check out fundamentally interchangeable Mace Inertial and ATRAN guidance systems.

In six ATRAN flights in a test vehicle at altitudes below 1,000 feet, as many as six jammers were employed to simulate enemy counter measures. In no case was the guidance system "confused" and the vehicle continued on its course with "a high degree of accuracy," say the Tactical Air Command and Martin Co. representatives (builders of Mace).

ATLAN, a map matching system de-

veloped by Goodyear Aircraft Corp., divorces Mace from any need for ground control. Since it does not depend on receiving electronic signals from the ground, it is almost impossible for an enemy to jam or confuse it. The new guidance system relates a film strip, actual or synthetic, to the terrain over which Mace is flying. If there is any deviation from the programmed route, the missile's flight is adjusted to rematch the terrain with the film.

Air Force missile teams are now launching the TM-76s completely on their own with no help from Martin Co. field test engineers.

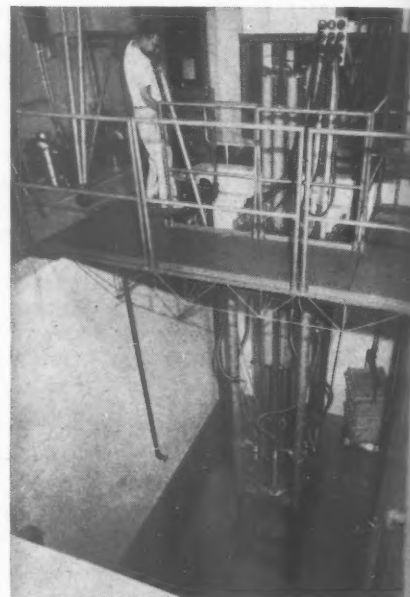


The Mace undergoing test of interchangeable guidance systems.

Paul B. Wishart, M-H president, hailed Orthotronic Control as "the most significant breakthrough in the state of the art in the past ten years" at a recent press conference. He called it "the final step in electronic data-processing techniques to make the giant 'brains' totally self-disciplined."

Air Force Reactor Starts Operation

Preliminary nuclear reactor operations have started at the Air Force's new radiation laboratory in Dawsonville, Ga. The atomic research facility will go into full operation in the fall.



Fueling Test Reactor starts operation.

Purpose of the Critical Experiment Reactor is to prepare for full scale operation of the laboratories' 10-megawatt reactor to be used in developing the AF nuclear-powered airplane.

As the test runs started, construction was being rushed on the other nuclear laboratories, offices and buildings comprising the nuclear research installation, reportedly the only facility of its kind in the world.

White Sands Doing "Impossible"

Rapid-fire scheduling plus cooperation and conservation by the missilemen of White Sands Missile Range, N.M., have made reality of the impossible and are saving tens of thousands of dollars each hour for the nation's taxpayers, according to Wind &

ARMED FORCES MANAGEMENT

Sand, Las Cruces, N.M. newspaper.

With "efficiency in scheduling and carrying out missions and the increase in capability," says *Wind & Sand*, WSMR now test-fires five missiles for each one fired in 1954. That was the year the Army, Navy and Air Force co-users of the integrated missile range launched 598 missiles, a total tagged by most firing and scheduling experts as top-saturation.

But, in 1957, WSMR had 1,946 "hot" or live firings, a one-year record. Under present scheduling and "slide time" system, this year's capacity for live shoots is 3,000 or more, according to Range Controller Don Moore.

The scheduling "net," built around inter-communications systems and range-wide teletype communications, allows net members (one representative from each of the services and a committee chairman) to set up a week's forecast on Thursday. Then, each day of the week, the following day's forecast is firmed and forecasts for the second and third days are brought up to date.

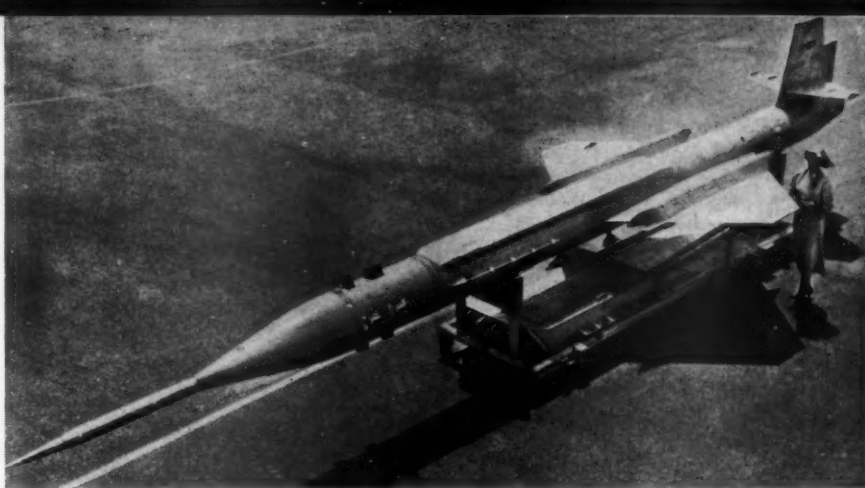
"Slide time," under today's range-use plan, is a program in operation less than a year. Each missile project is allowed 15 minutes beyond its "X" time or scheduled firing time. If the missile cannot be fired—usually because of technical difficulties either in the missile itself or in the many complicated and expensive pieces of equipment used to gather information on the test firing—it is scratched from the schedule.

Operations correlates its activities with the schedule, setting up telemetry, doppler, radar, various optical and other data-gathering systems involved in each test. "Our Operations people don't know what a lunch hour or a coffee break is," says Moore. "They work with a sandwich in one hand and a pencil in the other—but they love it."

Space Agency Compromise Expected

A compromise between House and Senate versions of legislation to create an independent civilian-controlled space and aeronautics agency is expected to be worked out, but no date has been set for consideration. The Senate Astronautics and Space Committee has approved a version varying from the House passed version.

Both bills provide for a single administrator, but House legislators want a 17-man advisory board comprised of nine government representatives and eight non-government members to help guide U.S. space development. The Senate unit, which unanimously endorsed its own bill, prefers a seven-man



New Lockheed X-7 ramjet-powered test missile is checked by Florine Cain (upper right), who helped design the supersonic vehicle and is one of the few women in this highly technical field.

Lockheed Completes New X-7 Model

Lockheed Missile Systems Div. has disclosed development of what it termed a "new and hotter version of the record-breaking X-7 missile."

Delivered to the Air Force in late June, one month ahead of schedule, the 37-foot-long, air-breathing missile, says Lockheed, incorporates a number of advances. They include:

1—An ability to carry four different types of Marquardt ramjet engines.

2—A recently perfected autopilot which responds to commands in 1/16th of a second, twice as fast as the older version.

"policy-making" board within the executive office of the President. It would be "non-operating."

Consisting of the Secretary of Defense, the Secretary of State (but obviously their designees), the chairman of the AEC, the director of NASA and three presidential appointees, it would have the power to assign responsibility for major projects and settle disputes among operating agencies. The Secretary of Defense could appeal to the President dissatisfaction with the Board's decisions.

In this respect, the Senate measure appears to hew closer to recommendations by military witnesses who want assurance that the development of advanced space weapons will not be hampered by civilian control. Both measures specifically exempt weapons development.

From the language of the bills, it appeared yesterday that the civilian vs. military control of space development may still present a stumbling block to final approval. The Senate report declared: "Your committee believes great mischief could be wrought by this delegating to the civilian space agency authority over military weapons systems and operations in this field." At

3—Advanced camera instrumentation to permit twice as much film coverage during the entire flight for detailed analysis.

4—Underwing boosters to allow ground, as well as air, launches.

5—Reinforced structures to withstand even more punishing test requirements, and speed and altitude demands.

Missile will be used to test latest ramjet engines being built by the Marquardt Aircraft Co. for the AF advanced interceptor missiles.

the time it called for civilian control of space development in the non-military areas.

The House bill is more definite on the question of civilian control. But the dilemma facing both sides of Congress is how to divide neatly which type of space vehicles shall be developed by civilians and which by the military. Attempts thus far to write this into the bills have produced little more than fuzzy generalities. Very likely this question will still be unanswered when, and if, Congress sets up the new agency.

Dyna-Soar Project Contractors Named

Boeing Airplane Co. and The Martin Co. have been named prime contractors to develop competitive designs for Air Force's Dyna-Soar boost-glide space vehicle.

Both companies will draw heavily on other firms for assistance in the development program. Martin, for instance, will utilize the pioneering efforts of Bell Aircraft Corp. in the boost-glide field. Also assisting Martin will be Minneapolis-Honeywell, American

Machine & Foundry, Goodyear Aircraft and Bendix Aviation.

Boeing will team up with Chance Vought, North American Aviation's Missile and Autometrics divisions, Aerojet-General, Ramo-Wooldridge and General Electric.

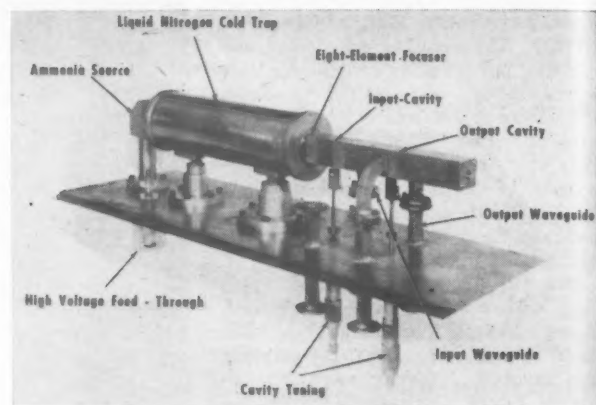
Air Force and National Advisory Committee for Aeronautics will manage the project jointly. Both have been working on the boost-glide concept since 1951.

USAF says advanced knowledge indicates the Dyna-Soar will have capabilities for many missions since it can operate from outer space down to altitudes well within the atmosphere, where it can maneuver and land. By varying the original rocket boost and with controls available to the pilot, the vehicle will be able to make "from one to many" earth orbits and return to the atmosphere safely, Air Force said.

The initial aircraft is expected to cost about \$150 million, but there was no disclosure of money involved in the developmental contracts.

The Dyna-Soar project will be preceded by North American Aviation's X-15 research vehicle, which is expected to make its space flights early next year. The X-15 is a joint USAF, Navy and NACA project to probe space flight.

Philco's "atomic" amplifier.



Philco Develops "Atomic" Amplifier

Philco Research has announced development of a special type of gas Maser, also known as an "atomic" amplifier, for the Signal Corps.

The Philco Maser is the first "atomic" amplifier to demonstrate uni-lateral (one way) gain of microwave energy by means of two electrically isolated cavities connected by a beam of neutral ammonia gas molecules. Energy is transferred from one electro-magnetically isolated point to another by the flow of these molecules.

Prior to the development of the Philco "atomic" amplifier, all Maser amplifiers were basically bilateral devices and had all the problems of common input-output terminals. Masers have excited the electronics industry because they remove the noise inherent in conventional electronic devices. They can provide amplification approaching the theoretical limit of no extraneous noise.

Army Develops New Map Device

A cartographic grid-ruling instrument capable of producing rectangular grids of high accuracy, and suitable for field use in compiling maps, has been developed by the Army Engineer Research and Development Laboratories, Ft. Belvoir, Va.

Now undergoing service tests, this instrument is designed to decrease the time required for drafting map grids.

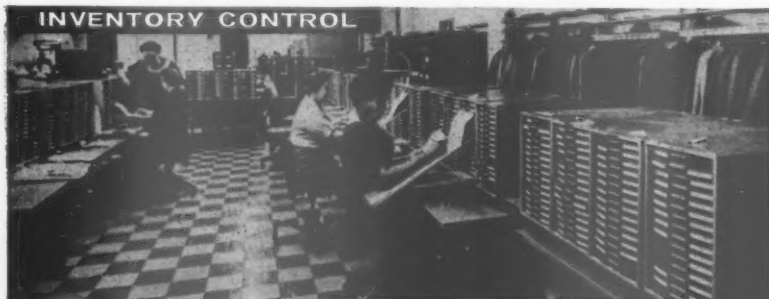
Simplicity of design and operation is featured to achieve a reduction in the levels of skill and experience required of personnel employed in the drafting phase of mapping.

Air Force Evaluating Minuteman Proposals

Contractor proposals for the Minuteman, the Air Force's solid propellant ballistic missile family, are now being evaluated by the AF Ballistic Missile Agency at Inglewood, Cal. So impressed has Congress been with the solid propellant idea that it provided more money than the Administration asked for both Polaris, the Navy's system, and for Minuteman.

Chances are considered good that because of pioneering work done in preliminary research and the Polaris program already under way, the new Air Force program will move into high gear relatively quickly. Indications are that the services are now aiming for operational missiles using solid propellants and, if not solids, in all cases storeable fuels by the mid-1960s.

ARMED FORCES MANAGEMENT

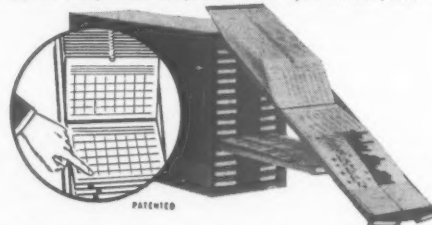


Typical installation of Wassell Sig-Na-Lok visible cabinets—used at a St. Louis Depot for an inventory of Army vehicles, planes and replacement parts—

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The New Idea In Industrial Mobilization

For the first time in the nation's history, there is no doubt of enemy ability to hit our industrial reserve, traditionally one of the nation's most effective weapons. How will the services meet this threat?

by Fred Hamlin, Jr.

SHORTLY after Korea, top Air Force planners discovered a new problem. After an all-out atomic attack, they could foresee aircraft and guided missile production halted by the loss of producers of critical sub-assemblies, components or specification parts.

In simplest terms, this meant that the armed services were going to have to fight with what they had on hand at the start of an all-out conflict. As recently as World War II, our enemies could not attack American industry. With the slight exceptions of saboteurs and submarines shelling the coast line, there was no danger. This situation no longer exists.

Former wars broke into four phases: (1) declaration of war, (2) mobilization, (3) the decisive phase, and (4) the exploitation phase, or mopping up residual enemy forces.

With nuclear weapons carried intercontinental distances by hypersonic aircraft and missiles, the first three phases, from the Air Force standpoint, are compressed to a matter of weeks or days. Because of this, the industrial mobilization which served the country so well in the past may virtually disappear. With today's ultra-complex weapon systems, drawing components from many phases of industry to a central assembly point, one hit in a variety of places can end, essentially, production of a given system.

The answer is obvious. First stated by the Air Force, and adopted by Defense Department and Office of Defense Mobilization in March this year, the policy is now one of pre-conflict mobilization. There must be a full force on hand in the first decisive stage of nuclear war, and the service must get every available undelivered new weapon from the factories as soon as possible. There will be no chance to hide behind the oceans and build a war machine.

On March 27 this year, Defense Secretary Neil McElroy established DOD policy guidance for planning with industry for national emergency

or mobilization production. The heart of the order was what it did not say. There is no provision in Directive 4005.13 for a three-year extended mobilization of industry as before. "Planning with industry," says the directive, "will emphasize those elements that will increase pre-war readiness without major reliance on post-attack production."

Steps for major war preparation are three-fold in McElroy's order. First, he calls for "utmost effort" to insure production. Second, he directs the DOD establishment to select a highly essential group of items "so as to maximize immediate post-attack delivery of such items in process in surviving plants." Finally, the military departments will consider dispersal of production and maintenance resources and alternate sources for vital production and maintenance.

The directive's impact is blunt and to the point: Grab what you can and forget the rest. Air Force implementation is equally realistic. Issued in May, Air Force Regulation 78-4 virtually denies post-attack mobilization, and builds from there.

Critical Phase

The critical phase of a major war, according to the AFR, will last only a few days or weeks, and should decide the ultimate outcome. The regulation states five goals for the Industrial Production Readiness Policy: (1) The policy will produce and maintain an in-being modern Air Force. (2) It will compress into days and hours the delivery of critical production aircraft and guided missiles in the event of imminent or actual general war. (3) It will provide means to accelerate production of selected weapons and support systems in case of local conflicts. (4) It will set up a system to identify surviving industry after an initial attack and, (5) It will maintain the aircraft industry health as necessary to fulfill Air Force needs.

Compression of delivery time has received full Air Force attention. To achieve this, the Air Force must be selective in its requirements. Delivery

priorities are chosen roughly on a four-point basis. First is the relative importance of the system's mission. Second is its capability and versatility. Production status and productibility, in addition to current inventory, make up the final two points.

Delivery of planes and missiles is broken into two phases. First, all planes which can be flown away immediately are picked up from the factories. Next, the contractor continues producing his system, counting on assembling only those for which he has necessary parts and components on hand. Air Force assumes only that the assembling plant is intact. They do not count on transportation, additional manpower, subcontractors, and feel that even communication facilities will be limited.

To insure immediate delivery of as many systems as possible, Air Force has called for greater speed and precision in all facets of program management. The directive spells out measures, including use of electronic data processing, to accomplish this.

For industry, Air Force has initiated a plan providing the manufacturer with as many necessary parts and materials on hand as possible. These material stockpiles are financed with funds authorized for current procurement.

This planning for quick deliveries came considerably before the March directive. Industry has been willing to cooperate, and paper tests last summer were called successful by the Air Force. (There has been nothing more substantial than these paper tests, says DOD.)

Standby industrial capacity is disappearing from Air Force thinking. The AFR sets up active production as the only justification for plant existence. It calls for realistic policies on use, retention and acquisition of industrial facilities, drawn on the basis of active production.

Idle machine tools and the purchase of new tools are treated by the Air Force primarily as they satisfy the requirements of current programs. Modernization and augmentation of

existing plants take second and third places in the program, and maintenance of idle equipment comes last.

Package plants and stand-by lines not in actual use are on the way out. Costs are higher for constant mobilization, and it is impossible to maintain the concept unless idle dollars are cut to the absolute minimum.

The new concept calls for a straight line curve of production rates, less than the former peaks, but more than the valleys. One notable result is in the area of personnel. Without the tremendous production surge after initial hostilities, the need for administrative personnel is drastically cut. The panic of priorities, allocations and control of material are theoretically ended. By maintaining an even production level, the mobilization rush is over before it starts.

This is not to say that Air Force will support only immediately useful production. It will continue to aid pilot line and research and development operations—but this will be done only as it is needed to keep technologically abreast or ahead of other nations.

Fuzzy expansions to meet vague requirements will be viewed with a cold eye. On the other hand, such programs as solid rocket fuels will be supported because there is a clear need for them in the reasonably near future.

In addition to this, Air Force is presently urging industry to carry on their own research and development. Lt. Gen. C. S. Irvine, AF Deputy Chief of Staff, Materiel, is one of the leading boosters of industry research, and his repeated criticisms of retrofit practices, in which delivered aircraft are called back to the plant to correct difficulties, are also in line with the new concept.

On the same day that the directive was handed down on industrial planning, a directive was issued outlining plant reliance and support priorities. Heading the list were altogether privately owned facilities. Private concerns with government equipment already installed were next on the list, and a low third was held down by purely government facilities.

The Air Force is moving to this end. Following the directive, letter discussions with industry and Air Force field stations were carried out. More important, Air Force is presently conducting "rigorous" review of its existing contracts. Spending on the older theory of production mobilization priming, the subsidy of a reserve, is being screened out.

These are all provisions for a general war in which the industrial

base of the United States is attacked. Most likely at the present time is local, limited war. In this type of conflict, the first assumption of Air Force planners is that the industrial base of the nation will not be attacked. In this light, plans have been set up to provide for increased industrial output to support limited hostilities. Another basic Air Force assumption involves current priorities. Strategic Air Command is getting top preference. As a result, the drain on supplies in limited war, primarily on tactical and transport commands, would not effect preparedness for the first stage of a general war.

The three services differ in their approaches to the mobilization planning problem, primarily because of the basic differences in the services themselves. Say DOD planners who are monitoring this entire development: Army and Navy are not in constant production, and rely to a greater degree than the AF on conversion of industry after initial attack; AF sees no conversion problem on end products, but perhaps does not realize that many parts used in aircraft could get sidetracked on priority to other services (priority not of what to make but of where to deliver); AF has been on a build-up program and counts only on an increase of existing production; and the Air Force also feels that its major contribution in a war will be in the first weeks and/or days while Army and Navy are faced with a continuing need for supplies (although BuAer has tried the AF-type planning to a "minor degree" on a test basis, particularly production compression).

Who it Affects

In the services, the change to the new system primarily concerns materiel people. Air Materiel Command in the Air Force, Dcs/Log in the Army and Office of Naval Materiel are each faced with unique problems.

While one aircraft could conceivably last the Air Force for the duration of a war, each infantryman has a continuing need for bullets or boots. On the other hand, Navy does not use ships in the quantity that the Air Force uses planes.

The result is that the Air Force was earliest and most eager to make use of the "fight with what we have" concept. In addition to deriving the idea, they were the first service to outline specific implementation for Defense Department's directive of the plan.

Program management fell to Air Materiel Command. As spelled out in the AFR, AMC will: (1) develop, finance and execute projects necessary

to program objectives, (2) make recommendations to USAF Headquarters for needed governmental/legislative measures to implement the program, (3) prepare and issue instructions and directives needed, (4) request advice and assistance from other commands for emergency evacuation of weapons systems from industrial plants, (5) balance new and maintenance-engineering production capabilities and, (6) report progress to USAF Headquarters.

Navy presently has sent only an "implementation notice," and Army has done essentially the same. Both have notified their field offices not to violate the DOD policy, but they are waiting for specific Defense Department direction, due any day now.

This soon-to-be-released DOD implementation will encompass Air Force planning, but will make more liberal limited war provisions. Writing of the implementation is "pretty much underway"—has gone to the Assistant Defense Secretary for Supply and Logistics for approval.

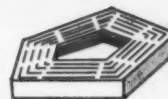
The Problems

From a DOD standpoint, Air Force is in the position of a trial balloon, i.e. they have approval for this sort of planning, but are not to "leave the other services holding the bag." DOD says the Air Force plan is fine as far as it goes, but it needs to go farther, and to consider more than this one approach. Seeing the measure as the first acknowledgement of the possibility of more than one type of attack, DOD reasons that to prepare fully for one type of combat is to advertise a deficiency in other types. Their idea: prepare for anything—play all possibilities rather than try to second guess the situation.

Defense sees advantages in both approaches to the mobilization problem but feels that neither has all the answers. Citing what they term "serious discrepancies" in AF and other planning, they are currently seeking all-service agreement for an implementing directive on mobilization. There is some sentiment in DOD that the Air Force is too much oriented to general war. Said one spokesman, "While they probably have fairly good planning for this, they may not give enough strength to limited war."

Certainly the problem of blueprinting industrial mobilization to satisfy the needs of all three services is one of the most vexing, and important, questions facing military planners today. And, just as certainly, obtaining an answer in the next few months is going to require the highest type of cooperative inter-service effort.

ARMED FORCES MANAGEMENT



This Month: Maj. Gen. William M. Creasy, USA

Chief Chemical Officer

WILLIAM Murlin Creasy, 53-year-old Army Chief Chemical Officer, sat at a large mahogany desk in his carpeted office one day last week reminiscing about life in the field artillery in the late 1920s.

Possibly because the recalcitrant Army mule just seems to generate this type of anecdote, most of pipe-smoking General Creasy's stories are unpublshable. For an entirely different reason, most of his work and the work of the Chemical Corps today also receives little publicity. Because of the sensitive nature of his field, Chemical, Bacteriological and Radiological (CBR) warfare, Defense Department, to a large extent, has kept him under wraps.

A 1926 West Point graduate, Creasy transferred to the Chemical Corps (then called the Chemical Warfare Service) in 1929, moved steadily up the ladder until May 8, 1954 when he became Army Chief Chemical Officer, one day after receiving his major general stars.

Creasy's job: see to it that the Chemical Corps gives the nation the capability for coping with chemical, biological and radiological warfare. The mission includes not only the conduct of research and development in these fields, but the manufacture or procurement of the material developed. The Corps also provides necessary training for the services in use of the material. Because the mission is so broad, the Corps works not only for the Army, but also for the Navy and Air Force and such non-military agencies as the Federal Civil Defense Administration and the Public Health Service.

Says Creasy, "There is still a tendency by many people to bury their heads in the sand at mention of chemical and biological warfare. This is the type of thinking in which an aggressor would like us to indulge. If carried far enough this attitude will leave us defenseless in a method of warfare which offers many advantages to an enemy.

"If an enemy felt that it might be possible to render us impotent as a fighting force, but at the same time preserve our industry for his own future use, what assurance do we have that he would neglect the use of any means that would make this possible? We have none."

What are the effects of CBR

weapons? According to Creasy, they include:

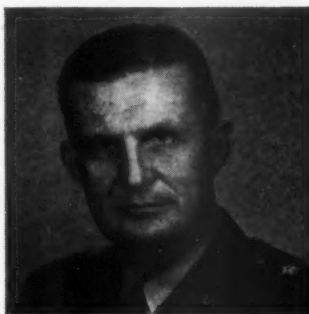
1—they are agents of minimum destruction, i.e. in themselves they do not cause destruction of facilities, but instead attack the people who operate the facilities;

2—the degree of their effect on people can be controlled;

3—their casualty effect is greater (it takes five or six men to care for a sick person during convalescence. A dead soldier is no such liability);

4—CBR permits covering large areas to military advantage with a minimum of logistical effort.

The amount of money given Creasy each year to carry on his operation is minor compared to U.S. expenditures



in a military nuclear energy effort, although you reach the justifiable conclusion, in talking to him, that the CBR area is just as important. (Fiscal '58 budget figure was about \$100 million, including \$38 million for R&D. Fiscal '59 budget request is approximately the same.)

Creasy has divided the Chemical Corps responsibility into four functional areas (troop training, R&D, engineering, and materiel), assigned field responsibility for handling it, uses his Washington staff to coordinate the show and retains for himself only the authority for removing a man to whom he has given responsibility.

His field commanders have access to Creasy if they don't like one of his staff directives, but normally, his commanders will deal with his staff. He has gone outside the Chemical Corps to fill some key positions, i.e., Comptroller is from Finance Corps, transportation officer from Transportation Corps; and has given his top civilian people command authority where they need it, such as in the R&D area.

But he takes strong issue with this theory that Civil Service workers are the real coordinating force in military business because they aren't being constantly transferred from station to station. His contention: the military man's career is dependent on his success in contributing to the military effort. On the other hand, the civilian working for the military measures his success in terms of what he contributes to his particular field, such as electrical engineering, accounting, etc. and he is as likely as not to move out of the military as his stature in his specialty grows.

Creasy is not too concerned with how his organization looks on the wall charts because, he says, "it is the people who make an organization work smoothly. You can draw up a very pretty organization chart but putting the people into it is the problem. If they don't like it or aren't sold on it, they can sabotage the effort without even trying."

Concerning CBR warfare, a recent poll indicated the American people aren't particularly worried about it. Consequently, Creasy often wages a lonesome crusade for understanding. His goals:

"First, there must be a general realization that the CBR weapons pose a hazard to our national welfare just as do the nuclear weapons.

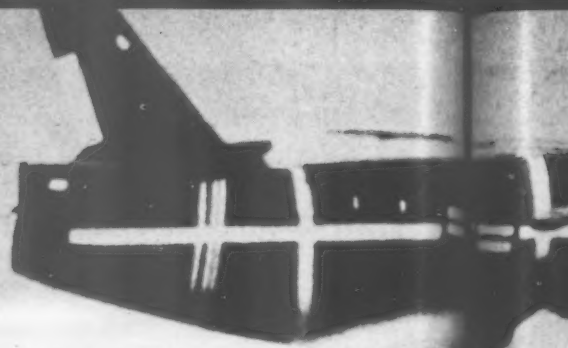
"Second, we must educate our citizens on these munitions so that our understanding of their nature will not be clouded.

"Third, defense measures which the Corps has developed for military use must, wherever feasible, be incorporated into our civil defense planning.

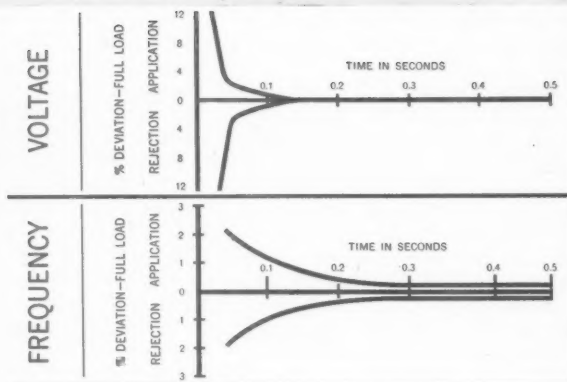
"Fourth, we must achieve and maintain such defensive strength in the CBR warfare field that an aggressor will not be tempted to use them against us."

How far has the Corps come in preparing for CBR warfare? Recent developments include methods for detecting the presence of nerve gases in the air. The Corps has developed the means for rapid detection and identification of disease germs, has developed material for use in masks and shelters to filter out air contaminated by chemical agents, germs, and radioactive dust. There are many other developments, either completed or in progress for protection of both military troops and civilian population. But there is a great deal more to be done.

Says Creasy, "We cannot afford to be surprised."



Snark Missile is powered by this Caterpillar Electric Set, photographed at Cape Canaveral, Florida. Full designation: Caterpillar 60 KW 400-cycle 120-208 Voltage Low Silhouette Portable Ground Support Unit with Precision Control Regulation.



Almost instantaneous return to normal of the new low silhouette Cat power unit (left) under conditions of full-load application and rejection is shown in the above graphs. In each case test was made under a voltage output of 117.4 volts.

Caterpillar Engines help power Un

Rocket boosters blazing a flaming trail, the Northrop Snark SM-62, first U. S. intercontinental guided missile, roars skyward from Cape Canaveral, levels out and hurtles south to the Caribbean.

The precise power used for ground support of the Snark is provided by a Cat Electric Set, designed and engineered for the missile program.

On isolated, down-range islands, the missile is picked up on radar, monitored as it streaks by, and the in-flight data is recorded and transmitted to Cape Canaveral for processing.

The power for these tracking stations—for the delicate, complex equipment and for living facilities for station personnel—is provided by Caterpillar Stationary Electric Sets.

An electric organ helps relieve the monotony of life on these vital but lonely stations. Caterpillar Engines supply the electric power needed to operate effectively in remote places.

Modern, heavy-duty diesel engines by Caterpillar are playing an important role in the rocket and missile program, and in other important military applications.

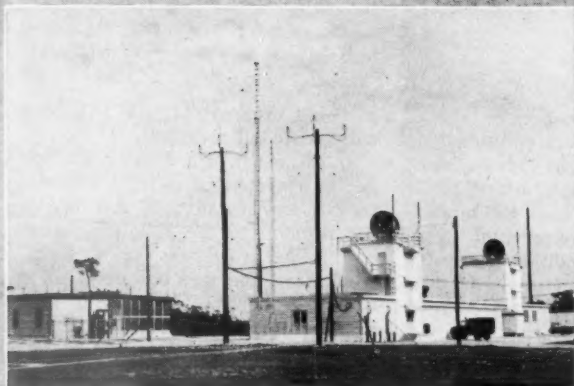
Caterpillar Engines can operate in any climate or altitude. Cat Engines were chosen to supply power for the Antarctic Expedition for the Geophysical Year (Operation Deep Freeze).

Caterpillar Engines can operate on any fuel, from JP-4 through No. 2 furnace oil, without adjustment or dilution. This means Cat Engines can use readily available fuels, eliminating storage or safety problems.

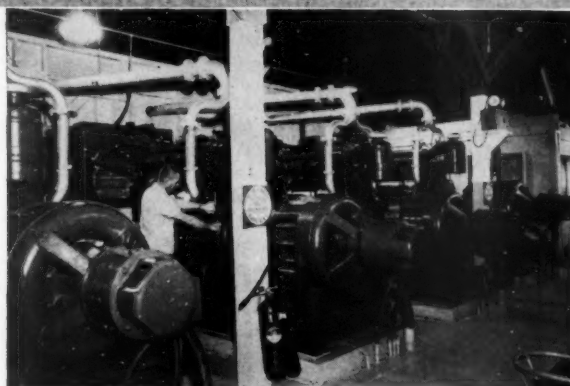
Relatively untrained personnel can operate and maintain these dependable power packages. Only

Weather information needed for missile testing is gathered in this weather station on Eleuthera. Precision equipment used here demands steady, constant diesel-produced electricity.





Central Control at Grand Bahamas Auxiliary Air Force Base is powered by Cat Electric Sets. This is one of 12 such stations that chain southeastward from the Florida Coast to Ascension Island, south of the Equator between Brazil and Africa.



These are Caterpillar Engines supplying electric power on Eleuthera Auxiliary Air Force Base, one of the down-range tracking stations. Each of the engines, generating as much as 68,000 KWH each month, has been operated more than 90,000 hrs.

er United States missile program

two minor adjustments are necessary on a Cat Engine: fan belts and valve clearance.

An important factor in military preference for engines by Caterpillar is the world-wide availability of Caterpillar parts and service—832 facilities in the Free World; 398 of them within the Continental United States.

Modern, heavy-duty Caterpillar Engines are a result of more than a quarter century of diesel leadership. Creative engineering plus a quality of workmanship that is the standard of the industry has made Caterpillar power an overwhelming choice where precise, dependable diesel engines are a must.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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N. W. Ayer & Son, Inc.

"We've had little down time with our dependable Cat Engines," says Burt Niro, Pan American Airways Base maintenance supervisor, Eleuthera. James McCullough, base manager, is at right.



Special Governmental Projects, Dept. AF7, Engine Division
CATERPILLAR TRACTOR CO., Peoria, Ill.

☐ Please send me additional detailed information on Ground Support Electric Sets.

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Base (or Firm)

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City Zone State

How Industry Can Fight Disaster

There is a growing movement among industry to organize cooperatively to fight disaster. The idea, Industrial Mutual Aid, started in Louisiana, has spread to Texas, Ohio, West Virginia, and New Jersey.

by Murray B. Gordon

Office of
Inspector of Naval Material
Cleveland, Ohio

DISASTERS rarely strike an industry. When they do, investments of millions of dollars and many lifetimes of work can be erased. This problem has long faced industry. However, the cost of providing the necessary equipment and personnel to safeguard a plant properly can be prohibitive.

One common sense solution that seems to be gaining favor with "big" and "small" industry is Mutual Aid. American history is full of instances where communities and individuals have banded together for their common good to overcome a problem.

Industrial Mutual Aid is not a new idea. There are approximately fifteen groups; at Baton Rouge, La., which was founded in 1944; Houston and Texas City, Texas; Linden, N.J.; Evendale, Ohio; the Kanawha Valley, W.Va.; four in the Cleveland area, and others. These groups have developed common plans for combatting a disaster and have agreed to pool their firefighting, rescue and first aid equipment when necessary.

Navy Interest

We, as Navy representatives in the field, are extremely interested in these groups in connection with the Industrial Defense Program. Under this program, we are assigned the responsibility for periodically surveying plants that are considered critical to the Navy's production needs. Recommendations are made to management to improve the ability of the company to withstand natural disasters, enemy attack and sabotage in order to continue producing.

The protection of these key facilities cannot be separated from the overall community effort. A plant may have made excellent preparations for disaster but it is not self-sufficient. It must depend upon its neighbors and the cities' services. In some areas such as Cleveland, there are excellent police and fire departments; in others, these services are almost non-existent.

During a recent fire at a paint factory in Cleveland, most of the city's

fire equipment was used. If another fire of any size had occurred elsewhere, handling it would have been most difficult. In an enemy attack, little help can be expected from the municipalities or other governmental agencies. Under these conditions, industry would have to depend upon its own resources.

Organization

The Mutual Aid groups in Cleveland started a year ago, during the course of an Industrial Defense survey at a key facility. One of the questions in the survey form pertains to Mutual Aid. During the interview, management suggested that the Navy representative contact other companies in the area to determine whether there was interest in a Mutual Aid agreement. It was thought that a neutral party such as the Navy could obtain better results.

A conference was arranged at a nearby restaurant and representatives from eight neighboring industries were invited to attend. The question of Mutual Aid was discussed, and the representatives agreed to obtain their managements' opinions.

A second meeting was held, during which the group formed the Cleveland Industrial Mutual Aid Organization, covering a three mile area on the east side of Cleveland. This group presently has twenty-seven members including such diversified ones as the Bailey Meter Company, The East Ohio Gas Company, The General Electric Company, New York Central Railroad, Reliance Electric & Engineering Company, Thompson Products, Inc., Civil Defense and representatives of the Army, Navy and Air Force.

Personnel and Equipment

The members have submitted inventories of equipment and personnel available for rescue, fire fighting and first aid, and have listed personnel that can be contacted on a twenty-four-hour basis to release the required aid. The inventories are in the process

of being summarized, and will be distributed to all members.

In the event of a disaster, the member is expected to call the city's protective services first. If the city cannot respond to the situation, because of blocked roadways or a lack of equipment, the member may call the Chairman of the Mutual Aid group, or any of its officers, to request aid, or any other member known to be in a position to furnish the aid.

A set of by-laws has been prepared and accepted by the members. The by-laws cover purpose, communications, equipment and manpower availability, coordination with Civil Defense, liability and organizational matters.

The by-laws are not signed by the members and have no legal effect. If a member is unwilling or unable to furnish assistance, he is under no obligation to do so. He may withdraw from the organization at any time.

There are no membership dues or other fees. All charges and services, if any, are borne by voluntary donation by the members.

The question of liability is complex and very important. In a localized situation, employees operating under the Mutual Aid agreement are covered against injury by the Workmen's Compensation Act applicable to their own company. Injury and damage to third parties and/or equipment are protected against by insurance normally carried. The borrower of equipment assumes all responsibility for damage to the equipment.

In the event of a large scale emergency, when employees and equipment are operating under the instructions of Civil Defense, Sections 4123.031 through 4123.037 of the Ohio Revised Code apply to limit liability. Members have discussed this matter with their attorneys to insure that they are adequately protected.

In a large scale disaster, the organization is considered a unit of Ohio's Cuyahoga County Civil Defense. The Chairman has been appointed Industrial Zone Coordinator by Civil De-

fense. Personnel who may perform some duty in connection with the Mutual Aid Organization have been asked to enroll in Civil Defense and obtain a CD identification card. This will permit them to return to their plants through police lines if their services are required.

Other Groups

Since the first group was formed, three others have been organized in southeast Cleveland, southeast Cuyahoga County and southwest Cuyahoga County. Mr. Robert Livingston of the Cleveland Air Procurement District, and the writer have worked very closely in performing the initial contacts and planning the groups. At the initial meeting for an area, the purposes of Mutual Aid are discussed with the representatives of industry, utilities, hospitals and the municipalities, and it is requested that the approval of management be obtained to participate. At a second meeting the group can be formally organized, boundaries designated, committees appointed and officers elected. At present, 75 plants with approximately 100,000 employees are participating in these groups.

Three more groups are being planned for the Cleveland Area. Inquiries have been received from a number of cities in northern Ohio and it is anticipated that other organizations will be formed. Although industry can readily see the advantages to pre-planning for disasters, a number of problems are present in addition to those normally occurring in any voluntary program. The current recession has hindered most company activities, except those involved in obtaining orders and continuing production. Industry recognizes the vital importance of Civil Defense, but seems somewhat apathetic to it, although Cuyahoga County has an excellently organized and very active Civil Defense group. Some of the reasons that have been expressed for this are the political nature of Civil Defense on the local level, and the apparent indecision of authorities on what to do.

Despite these problems, company management recognizes that it can obtain a great deal of added protection, at almost no cost to themselves or the government, through a mutual aid agreement. In addition, community and industrial relations are improved. This cooperation among industrial and governmental neighbors has proved its value during a flood in Baton Rouge, La., a fire at Linden, N.J., an explosion and fire at Houston, Texas and many other disasters. There are indications that this form of cooperative effort will become more widespread.



Rudolph Valduga (left), chairman of the Cleveland Industrial Mutual Aid organization, and author Murray Gordon examine a Cleveland area map.



Paint factory fire in Cleveland last spring tied up equipment, left rest of city's industry virtually without civic disaster protection.



Author Gordon (right, standing) addresses civic, military and industry group organizing mutual aid effort in Southeast Cleveland.

AF Reserve Tool Program Control Shifts

Administrative control of the Air Force's Reserve Tool Program moves from Headquarters, Air Materiel command to Warner Robins Air Materiel Area, Georgia on August 15, 1958, General E. W. Rawlings, AMC Commander, announced recently.

This administrative change will provide unified control of the inventory.

Under the present program, control rests partly with the Directorate of Procurement and Production and the Directorate of Supply of Air Materiel Command. The command, in announcing the move, noted that control and responsibility at Warner Robins will be placed at a directorate level.

The change will consolidate the records of the two directorates and provide for single point management. After August 15, government contractors, authorized to obtain machine tools from the Air Force inventory, may screen all records on tools in one place. In addition, a common machine tool nomenclature is being devised by AMC to consolidate the Federal Supply Cataloging system with the special coding system devised for the Air Force's tool program.

Sixty positions at Headquarters, AMC will be involved in the transfer. The machine tools will not be moved

from their present storage sites at Terre Haute, Indiana; Palmdale, California; Marietta, Georgia; and Omaha, Nebraska.

Air Force Approves GE Build-up

The Air Materiel Command has approved full release of \$3.8 million for production facilities for General Electric T58 turboshaft engines.

According to Guy Shafer, general manager of GE's Small Aircraft Engine department, which developed the T58 for the Navy's Bureau of Aeronautics, "This will enable us to procure additional machines and tools, and to build new production test cells. We plan to have most of these facilities in place by the end of 1958, so that we will be in full production on T58 engines next year."

The T58 is a turboshaft helicopter engine weighing 271 pounds and delivering 1050 shaft horsepower. Applications include the Kaman HU2K-1 utility helicopter and Sikorsky's S-61 and S-62.

Senators Asked To Nudge Air Force

The Senate Military Appropriations Subcommittee has been asked to nudge the Air Force on a pending proposal to buy a limited quantity of Fairchild F-27 turboprop transports. A joint letter from Maryland Republican Senators J. Glenn Beall and John M. Butler to the committee pointed out that the Air Force had been weighing the plan for over six months but had not acted.

Air Force Chief of Staff Thomas White, appearing before the subcommittee, confirmed that the F-27 was under consideration with other proposals for replacement of AF medium-range transports. The Butler-Beall letter, disclosed by Sen. Styles Bridges (R-N.H.), a committee member, suggested authorization for the F-27s be incorporated in the fiscal 1959 defense appropriation bill. The Maryland Senators said decision now could spur employment in Hagerstown, Md., plant of Fairchild.

Gen. White, however, indicated that the Air Force was in no special hurry to make its final decision. He said replacement of the Air Force's old shorter-range transports was under consideration.

In an interview, Sen. Bridges amplified his own views. He said eventually

the military is going to have to buy replacement planes of the F-27 type.

Bridges also said he believed the Air Force had clarified its need for a utility jet transport. The House struck \$23,000,000 from the appropriation bill, observing that the military had shown no need for executive transports.

Gen. White told Congress that the planes were required, not so much as executive transports but to provide training for navigators in jets.

AF Selects 37 For Expenditure Control

A total of 37 Air Force contractors have been selected for expenditure management control during fiscal 1959. Management and control of expenditures as it will be practiced in fiscal year 1959 is spelled out in Air Force Regulation 70-13.

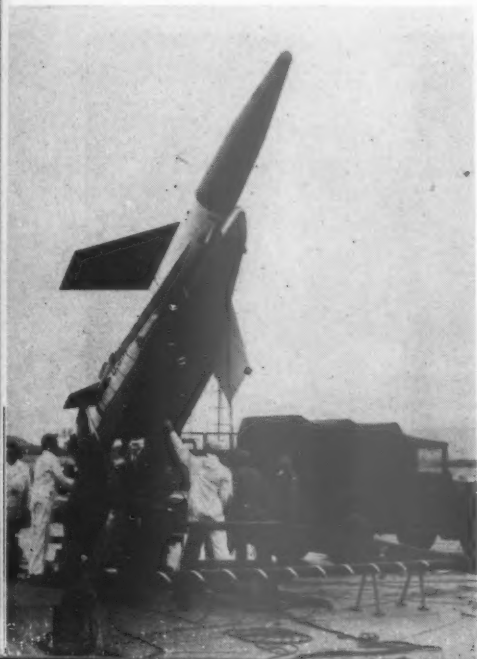
The regulation describes current policy objectives as follows: "The objective of the Air Force is to manage and control expenditures in the central procurement area so that expenditures will not exceed predetermined objectives."

To accomplish this purpose, Air Force will establish expenditure targets by month for the current fiscal year and by quarters for succeeding fiscal years. These targets will be imposed on the major contractors "that represent at least 75% of the expenditures involved."

Contractors falling in this category are: Aerojet-General; AC Spark Plug; Allison Division of General Motors; Arma Division of American Bosch Arma Corp.; Avco Mfg. Corp., Research and Development Division; Bell Aircraft Corp.; Bendix Radio Div., Boeing Airplane Co., at both Seattle, Wash. and Wichita, Kan.; Burroughs Corp., Paoli, Pa.; Burroughs Corp., Detroit, Mich.; Convair Division of General Dynamics Corp., both Fort Worth and San Diego; Douglas Aircraft Co. at both Long Beach, Calif. and Tulsa, Okla.; Ford Motor Co.; General Electric Co., at Evendale, Ohio, Philadelphia, Pa., Syracuse, N.Y. and Utica, N.Y.; Hughes Aircraft Co., at both Culver City, Calif. and Tucson, Arizona; International Business Machine, Oswego, N.Y., and Kingston, N.Y.; Lockheed Aircraft Corp., Burbank, Calif., and Marietta, Ga.; The Martin Co., Baltimore, Md. and Denver, Colo.; McDonnell Aircraft Corp., St. Louis; North American Aviation, Inc., Los Angeles; Northrop Aircraft Inc. and Radioplane; Pratt & Whitney

ARMED FORCES MANAGEMENT

Army recently unveiled a new lightweight launcher for its Lacrosse missile, developed by Cornell Aeronautical Laboratory, Inc., to provide helicopter transportability for the system. Army personnel are shown here preparing for a test firing from the launcher at White Sands Proving Ground, N.M.



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JULY

Aircraft Div. of United Aircraft Corp.; Radio Corp. of America; Republic Aviation Corp.; Sperry Gyroscope Co., and Western Electric Company.

Dropped from the list of contractors required to report were Curtiss-Wright's Propeller Division and Wright Aeronautical Division; Fairchild Engine & Airplane Co.; GE's Small Engine Division at West Lynn, Mass. and Western Electric's Winston-Salem, N.C. plant.

Added for the first time and now required to report are Burroughs at Paoli, Avco at Lawrence, Mass., and Arma at Garden City.

The fiscal 1959 program has been the subject of discussions in a recent meeting of Air Materiel Command, the Budget Bureau and industry.

Basic problem at the moment is that, seemingly, the AF is not planning to tell the contractors involved the expenditure target which each must meet. Discussions at the closed meeting were labeled "premature."

As of now, Air Force and the Bureau of the Budget are asking the contractors for forecasts which will be accurate within 2% to 3% plus or minus. The government is also indicating that if actual expenditures don't come within the accuracy range explanations will be demanded.

Other areas of conflict also exist. These include whether forecasts are needed for contracts where uninvoiced balances are less than one million dollars and whether the contractors should be held accountable for forecasts thrown out of whack because of the timing of AF actions in such cases as letters of intent and their conversion into contracts; terminated contract claims and a number of other such circumstances where AF actions control the expenditure rate.

Airways Say Mats Should Stick to Missiles

If the Military Air Transport service would concentrate on providing services not available from commercial air carriers, it would have its hands full and would make way for build-up of a Civil Reserve Air Fleet through greater commercial business. So say two commercial carriers in testifying before Sen. A. S. "Mike" Monroney's (D-Okla.) Commerce Subcommittee investigating MATS operations.

In presenting the idea, Lewis C. Burwell, board chairman of Overseas National Airways, told the committee that MATS was particularly lagging in the field of missile transport. He said, "Our tactical and scientific development is way ahead of our logistics, and for that reason, MATS should concern itself immediately with the tech-

A blown tire doesn't faze the Army's mechanical mule one whit in delivering company supplies as it demonstrated during recent exercises of the 101st Airborne Division at Fort Campbell, Ky.



niques of movements of these missiles." The shipment of missiles was termed by Burwell as "a peculiar function of MATS."

The same idea was expressed in earlier committee testimony by Delos Rentzel, president of Slick Airways. Rentzel said that most of the planes MATS is now buying are passenger craft, rather than heavy duty cargo planes capable of hauling out-size cargo. Rentzel pointed out that "the military does not have the capability of moving things in quantity as of this time in a successful air logistics airplane."

Committee chairman Monroney agreed with these points of view. "Our quarrel," he said, "is that they haven't got any special-duty modern equipment except the C-133 that can do this work, while they are duplicating, and continuing to duplicate in new purchases, the passenger carrying capacity that is available in large amounts." Monroney also said that "with the C-132, you could take two planes and very airfield in Europe would become a missile launching site."

Procurement Supplying R&D Funds

To support research and development of increasingly complex weapons systems Defense officials are now borrowing more money from procurement type accounts than is being appropriated for research itself.

An outline of a strong trend toward using procurement cash to finance the early research of advanced weapons was given to the Senate Military Appropriations subcommittee by Deputy Defense Secretary Donald Quarles. "Recent estimates of obligations for FY 1959 indicate that those in support of

research and development may approximate \$6.2 billion," Quarles testified.

He added that Defense officials are dipping into procurement accounts for "significant support" to purchase items for development, test and evaluation prior to quantity production, and for the acquisition of new facilities at contractor plants.

"This support from other appropriations has increased considerably in the past few years, primarily because of the complexity and resulting increased cost of modern weapons systems. The total support from these sources has more than equalled the amount obtained in research and development appropriations and is expected to continue increasing as current and future testing of advanced weapons systems is accelerated," Quarles said.

Navy to Buy Fewer Aircraft

The Navy will buy about 11% fewer aircraft in fiscal 1959 than in fiscal 1958. The revised fiscal 1959 plan called for a total procurement of 898 aircraft. Fiscal 1959 funds will permit the purchase of 707 aircraft, even though the dollar cost of these planes will be about the same as the FY 1958 procurement.

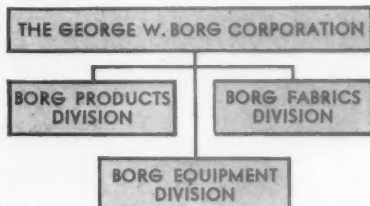
Pentagon to Cut Supply Items

A new program has been established by the Assistant Secretary of Defense (Supply and Logistics) designed to reduce the number of items in the supply systems of the Services. The policy is also intended to increase the number of common-use items for the Army, Navy and Air Force.

In order to accomplish this, Assistant

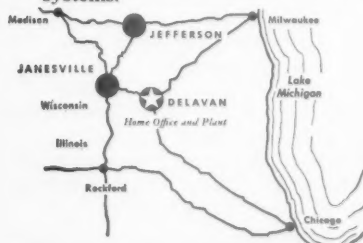
WHO IS BORG?

George W. Borg, who founded this corporation, is the "Mr. Clutch" who started with Borg & Beck. He then helped organize the Borg-Warner Corporation of which he became president. Later he served as chairman of the board until he resigned to devote his full attention to The George W. Borg Corporation.



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Manufactures automotive clocks.
- **Borg Fabrics Division**
Manufactures deep-pile fabrics best known of this line is the fashionable "Borgana" fabric.
- **Borg Equipment Division**
Manufactures Micropots (precision potentiometers), Microdials (precision turn-counting dials), instrument motors, frequency standards, aircraft navigational instruments and components for systems.



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Secretary of Defense Perkins McGuire has ordered that a series of codes be established to define the cataloging responsibilities, inventory management, supply status and standardization status of each item in the military supply system. He also ordered a catalog and inventory cleanup designed to accomplish the purpose of the new directive, number 4100.29.

Standard Containers Group Formed

All groups and organizations interested in the development of standards for shipping container sizes are invited by the American Standards Association (ASA) to participate in such work. The formation of a new national standards committee (sectional committee) under ASA procedures has just been

approved by the ASA Miscellaneous Standards Board, it was announced by Cyril Ainsworth, deputy managing director of ASA.

The committee's first meeting will be held at ASA on July 30 to lay out the plans for handling the technical work.

The scope of the committee will be the standardization of sizes of pallet containers, cargo containers, and van containers suitable for interchangeable use on different types of transports—rail, truck, plane, or ship.

"It is expected that standard sizes of interchangeable shipping containers will reduce transportation costs of practically every shipper in the country," said Mr. Ainsworth. "This standard project should be of interest to every company and organization that makes, distributes, carries, and receives goods."

NSIA Given Plan

To Reduce Defense Procurement Crises

An 11-point program designed to reduce the recurring financial crisis affecting both the Defense Department and the military contractors was outlined by E. B. Leatham, assistant to the president, Raytheon Manufacturing Co., at the spring meeting of the National Security Industrial Association's Procurement Advisory Committee.

Mr. Leatham said:

1. There is a "paramount need" for both the Defense Department and the Armed Services to do a better job in forecasting and budgeting their cash requirements.
2. An earlier review is required of the allocation of cash funds to specific projects or contracts.
3. Avoid the stops and starts in the procurement cycle which occurred during the financial crisis of last year, providing for a more even flow of contracts over the fiscal year. In this connection, better use of both DOD and industrial manpower at contractual level and a streamlining of procedures was recommended to eliminate the superfluous and cut down multiplicity of reviews. Mr. Leatham asks somewhat plaintively: "When are we going to begin to trust one another?"
4. Eliminate or minimize carryovers of unpaid bills from one fiscal year to another because any abnormal peaking any one year distorts the case requirements and "only puts off the day of reckoning."
5. Be more specific in debt-ceiling requirements, and "avoid, even for political purposes, inching up on the real requirements."
6. Extend, on a selective basis, the use of periodic funding to major systems projects, permitting a review of progress and a determination of the level at which the project is to be continued. However, to make this work, Mr. Leatham urged that the contractor be given advance notice—at least six months if possible—and in case the program is to be decelerated or eliminated, then the benefits of termination for convenience should be extended to the contractors—whether or not the future work has been funded.
7. Increase the rates of allowed profits if limitations on progress payments are to be continued at present levels in order to give the contractor a fair return on its investment.
8. Re-examine the policy of tightening up on grants of facilities having a use for Government work only.
9. Avoid asking contractors, even on a temporary basis, to finance the Government by deferring billings.
10. Increase the profit of Government contracts and thus improve the credit of defense industries, both by higher profit allowances and by recognizing and allowing all the true costs of doing business.
11. Place contracts on the merits and total costs or prices and not on whether the contractor agrees to withhold billings for some period.

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Washington 25, D.C.**

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Aeronautical GS-14 or 15
Aeronautical (Rocket Power Plant Development) GS-11 or 12
Aeronautical GS-12
Aeronautical Development Control GS-12
Aeronautical Power Plant Research (Propellant Research) GS-13
Architect GS-9 or 11
Electronics GS-9
Electronics (Instrumentation) GS-13
General (Electronics) Duty post in Garden City, New York GS-13
General (Ship Installations) GS-13
General Ordnance Design GS-12
Mechanical GS-11
Mechanical GS-9
Missile Launcher Design GS-12
Power Plant Development GS-9 to 12
Structural (Floating Structures) GS-11
Structural (Buildings) GS-9 or 11

ADMINISTRATIVE AND TECHNICAL

Digital Computer Systems Specialist GS-9 or 11

POSITIONS REQUIRING PERMANENT CIVIL SERVICE STATUS

ENGINEERING POSITIONS

Construction Management (Airfields) GS-11 or 12
Construction Management (Tech. Bldgs.) GS-12
Electronics (Instrumentation) GS-12

ADMINISTRATIVE AND TECHNICAL

Accountant GS-9
Analytical Statistician (Oper. & Adm.) GS-11
Automatic Data Processing Systems Programmer (Programming or computers) GS-9

Army Employment Coordination Office

**Rm 10, Old Post Office Bldg.
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Washington 25, D.C.**

Physical Science Advisor GS-15
Physical Science Administrator GS-15
Physicist (General) GS-14 and GS-13
Communication Specialists GS-14, 13 & 12

Physical Science Administrator GS-13
Electronics Engineers GS-14, 13, 12 & 11
Aeronautical Engineers (Guided non-ballistic Missiles) GS-13
Mechanical Engineer (Guided Ballistic Missiles) GS-13
Ordnance Engineer (Guided Missiles) GS-12
Safety Engineer (Industrial Hazards in handling explosives) GS-11 and 9
Mechanical Engineer (Military Logistics) GS-11
Medical Officer (Internal Medicine) GS-13
Medical Officer (General Medicine & Surgery) GS-12
Medical Officer (Pediatrics) GS-12
Analytical Statistician GS-11
Astronomer GS-11
Sculptor GS-9

**Industrial Relations Officer
U.S. Naval Avionics Facility
Indianapolis 18, Indiana**

Fire Control Design Engineer GS-9
Fire Control Design Engineer GS-11
Electronic Engineer GS-9
Electronic Engineer GS-11
Mechanical Engineer GS-9
Mechanical Engineer GS-11
Electrical Engineer GS-9
Electrical Engineer GS-11
Electronic Scientist GS-9
Electronic Scientist GS-11
Physicist GS-9
Physicist GS-11

**Industrial Relations Department
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Keyport, Washington**

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Supervisory Ordnance Engineer GS-12
Electronic Engineer GS-11
Electronic Engineer GS-9
Mathematical or Analytical Statistician GS-9

**Industrial Relations Department
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Forest Park, Illinois**

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**Director of Industrial Relations
U.S. Naval Ordnance Plant
Macon, Georgia**

Supervising Training Officer (General Fields) GS-11
Supervisory Digital Computer System Specialist GS-9

**Hdq. Rome Air Force Depot
United States Air Force
Griffiss Air Force Base, New York**

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Mathematician GS-9
Electronic Engineer GS-9
Industrial Engineer GS-9
Electronic Engineer (Instr.) GS-11
Electronic Scientist GS-11
Supv. Mechanical Engineer GS-11
Electronic Engineer (Radio) GS-11
Photographic Engineer GS-11
General Engineer GS-11
Industrial Engineer GS-11
Electronic Engineer GS-12

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Electrical Engineer
Industrial Engineer
Construction Engineer (Buildings)
Electronic Engineer (Gen)

Maintenance Officer
Supply Requirements and Distribution Officer
Mechanical Engineer
Contract Specialist
Mathematical Statistician
Industrial Property Inspector
Operations Analysts
(Engineer) (Physicist)
Logistics Planning Officer
(Electronic Data Processing Equip.)
General Engineer (Standardization)
Psychological and Experimental
Psychologist (Trng Devices & Equip.)
Logistics Officer (Supply)
Historian
Contract Specialist

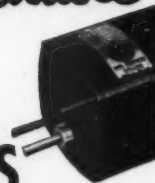
N. B. Applicants apply direct to base where vacancy exists.

GS-12	Washington, D. C.
GS-13/14	Washington, D. C.
GS-13	Brookley AFB, Ala.
GS-11	Brookley AFB, Ala.
GS-11	Williams AFB, Ariz.
GS-13	San Bernardino AMA,
1206 S. Maple Ave.,	Los Angeles 15, Calif.
GS-13	San Bernardino AMA
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GS-14	AF Ballistic Missile
	Div., Inglewood, Calif.
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Controlling a \$6 Billion Inventory

by Myrle J. Hogenkamp and
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THE world-girdling scope of Air Force operations and the ever-increasing complexity of modern air weapons result inevitably in formidable demands upon the management of materiel support activities. Outstanding among these requirements is the need for highly effective management of air vehicle engines, which are vital to performance of the Air Force mission, and which currently represent a \$6 billion inventory investment. Today, this task is being met through the practical application of electronic data processing equipment (EDPE).

Under the leadership of Maj. Gen. T. P. Gerrity, commander of Oklahoma City Air Materiel Area (OCAMA), the initial phase of an overall integrated system covering centralized reporting on all Air Force propulsion units has been implemented on EDPE at that AMA. A master tape has been established indicating by serial number a record of all facts required for engine management. This data includes information concerning unit cost, location, condition, hours since last overhaul, shipment, cause of removal from aircraft, parts causing failure, aircraft installation, configuration, etc. This master tape is updated

daily by direct reporting from bases and/or contractors to this centralized data-processing location.

There are more than 100,000 propulsion units located at hundreds of sites throughout the world. These units are in a constant state of movement and change; reporting forms are received at OCAMA at the rate of 5000-7000 per day. Accomplishment of engine management from cradle to grave is an extremely complicated process extending from the Congress to the smallest Air Force base. In between these two extremes, various levels must act to perform planning, programming, budgeting, procurement, distribution, overhaul and disposal.

Headquarters AMC, in conjunction with the AMAs involved, is developing an integrated logistical data system to furnish information for managers at all levels. The entire system is being programmed for application to the 705-II computer. Data contained on the master record is basic input for the various facets of the system outlined below:

Centralized inventory control of all propulsion units by serial number has been in operation since July 1956. The progress made in obtaining an accurate and timely inventory has been excellent.

It is planned to centralize property and monetary accounting records at OCAMA, eliminating the maintenance

of such records at all Air Force activities. This reduction of specific records will substantially reduce man-hours in this area. A monthly monetary report is presently being produced giving the dollar value of each segment of the overall pipeline.

From this centralized master file, inventory products in varying degrees of detail, dependent upon the level of management to which the reports are submitted, are provided.

1.—Inventory reports portraying location, condition (serviceable or repairable), installation, quantities built up and those requiring maintenance are used by engine managers to make proper distribution in order that each activity may accomplish its assigned mission. Summaries are provided to Hq USAF and Hq AMC to provide a basis for establishing procedures for more efficient management of overall assets. Other products providing such data as inventory of installed engines with associated aircraft and a daily summary of engines located at overhaul activities are produced for management use.

2.—Pipeline reports and analyses make data available concerning the actual and average number of days that propulsion units remain in segments of the pipeline, such as base supply, field repair, intransit and major overhaul. Transportation managers are

now receiving data allowing them to analyze past movements, time in transit and modes of shipment. This will be the basis for forecasting future movements for better overall management. Pipeline information is probably the most significant byproduct from the system to date for managers at all levels across all functions. These types of reports enable management to evaluate performance of base *versus* base and command *versus* command. For example, the allowable standard for major overhaul for a specific aircraft engine is 24 days. However, a segmentation report highlighted the fact that actual time exceeded 30 days for certain overhaul activities. Management was able to "pinpoint" the problem and take action to reduce the in-work time to the allowable standard.

In addition to the above reports, there has been initiated on a phased basis an automatic resupply program for aircraft engines. This program encompasses the ability to "signal" immediately each time the user stock level falls below a predetermined level, so that when an engine is removed from an aircraft for overhaul, a serviceable engine is automatically shipped to take its place.

This system included actuarial development, wherein the Air Forces use the same techniques as life insurance companies to construct failure tables for use in projecting engine removals and analyzing maintenance problems. The procedures, very complex and repetitive in nature, adapt very well to electronic computers. In fact, some of the calculations are too complicated to be done manually—the resulting human error would nullify the improved accuracy inherent in the method. The actuarial engine life is a

true measure of life since it is calculated as the mathematical expectation, in terms of flying hours of use, as an engine progresses through its life's cycle. It is used to compare the effects of different missions or environments upon engine life or can be used to make comparisons of engine life of new engines versus overhauled engines. Failure rates are computed for each major engine aircraft combination and are used to "pinpoint" trouble areas, such as early failures and abnormally high removals.

Three categories of information are now available on electronic computer tape—overhaul removal rates, field maintenance removal rates and the installed engine inventory data. These computations are currently operational on the Hq AMC Univac and are being programmed by Middletown Air Materiel Area (MAAMA) for 705 II computer application by October 1958.

MAAMA, under the command of Major General George R. Acheson, is developing a consolidated engine requirements package for electronic-computer application, which incorporates all present manual computations for determination of requirements, stock objectives and overhaul schedules. The computation starts with actual data from the inventory master file at OCAMA as its beginning. Time-phased computations are made utilizing actuarial techniques. The forecast of removals is the most essential factor in the calculation of spare engine requirements, engine overhaul schedules and spare-engine distribution. The program is designed to permit processing of organization or base-level projections. These projected requirements will be used as an input for automatic resupply and forecasting of transportation re-

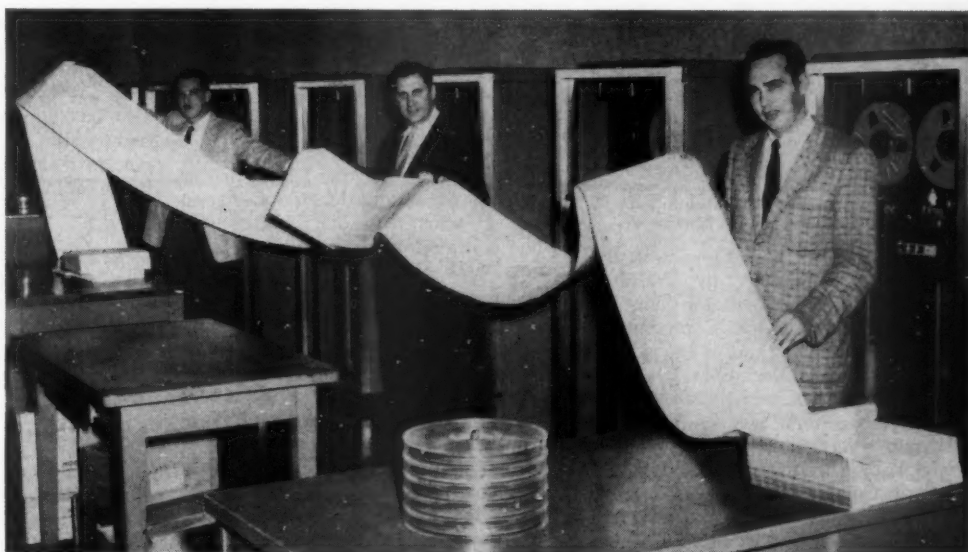
quirements for the future.

A configuration accounting system is presently being maintained to determine the current capability of each engine within the Air Force by serial number. By "current capability" is meant the modification changes that have been accomplished in order to effect better engine performance. This is known as technical order compliance (TOC). The accomplishment of a TO or a group of TOs may affect the service life, ease of maintenance, operational characteristics and spare-parts requirements. The objective of this program is to create a current record on the accomplishment and nonaccomplishment of TOs by engine serial number. This data is used to determine spare-parts requirements and to schedule engines for modification.

In addition, a materiel deficiency reporting system has been incorporated into the overall electronic data-processing package. This program covers reporting the deficient item or items which caused the engine to fail. This data will be used to develop engineering fixes, failure trends and spare-parts usage factors. The reports developed therefrom will be timely and accurate and allow management to evaluate them in order that the best and most economical system of "engine fixes" can be determined.

In summary, this is a major data systems-development effort directed toward securing a high order of management effectiveness, and therefore toward furtherance of a basic Air Materiel Command objective: "To establish and maintain the level of materiel support appropriate to each weapon and its employment, with a minimum investment in and expenditure of resources."

Aircraft engine inventory is recorded on the five reels of tape (foreground). A full printed report from the reels would fill the paper shown here to a length of more than a city block.





A key part of President Eisenhower's proposed Defense reorganization plan concerns the Joint Chiefs of Staff. To better understand what the changes may mean, here is the way JCS was working prior to changes made in mid-June as a result of the President's reorganization plan . . .

THE NATIONAL Security Act of 1947 established the Joint Chiefs of Staff as the principal military advisors to the President, the National Security Council and the Secretary of Defense.

To do the job, Congress authorized a JCS workforce of 210 officers. (President staff is in the neighborhood of 185. It is estimated that to implement President Eisenhower's reorganization proposals would require a staff of about 400.)

Today, the Joint Chiefs are charged primarily with:

- 1.—Preparation of strategic plans and provision for the strategic direction of the military forces.
- 2.—Preparation of joint logistic plans and assignment to the military services of logistic responsibilities in accordance with such plans.
- 3.—Establishment of unified commands in strategic areas.
- 4.—Review of major material and personnel requirements of the military forces in accordance with strategic and logistic plans.
- 5.—Formulation of policies for coordinating the military education of members of the military forces.

Background

The JCS came into existence as the result of the decision by President Roosevelt and Prime Minister Churchill (during the ARCADIA Conference—a series of military and political consultations held in December 1941-January 1942) to establish a supreme Anglo-American military body for the strategic direction of World War II, to be known as the Combined Chiefs of Staff Committee.

The JCS took form as the U.S. representatives on the Combined Chiefs

of Staff Committee, were soon functioning as a corporate leadership for the American military structure. JCS became the primary agency for coordination and strategic direction of the Army and Navy, advised the President with regard to military strategy, the requirements, production, and allocation of munitions and shipping, the manpower needs of the armed forces, and matters of joint Army-Navy policy.

Nevertheless, the functions and duties of the JCS were not formally defined during the war period, but they were left free to extend their activities as needed to meet the requirements of war. (The desirability of preserving this useful flexibility was the chief reason offered by the President himself for refusing to issue a basic directive.) With no charter, the JCS organization existed on the basis of its continuing functions, buttressed by the great authority of its members in their individual Service capacities.

Established by the NSA statute of 1947, the JCS has undergone a number of changes since. Among them:

1948 Key West agreement—of most importance was its authorization of long-standing JCS practice to designate one of the members as executive agent for a unified command, specified command or a particular operation or special type of development work.

NSA Amendments in 1949—set up the office of Chairman of the JCS and raised the permissible number of Joint Staff officers to 210.

Public Law 416 in 1952—placed the Commandant of Marine Corps in coequal status with members of JCS when considering matters directly concerned with Marine Corps.

Reorganization Plan No. 6 in 1953—gave the CJCS greater responsibility for organizing and managing the subordinate structure of the JCS.

Key West Agreement Revision in 1954—eliminated the previous provision for designation by the JCS of one of their members as executive agent and substituted the secretary of one of the military departments.

In President Eisenhower's current

Defense reorganization message he said, among other things, that he proposed to shorten the existing chain of command running to the unified commander in the field by eliminating the designation of a military department as the executive agency. Instead, the line of authority would extend only from the Commander-in-Chief to the Secretary of Defense, whose orders would be issued to the unified commanders by the Joint Chiefs of Staff. This change, which would add to the strategic planning functions of the Joint Chiefs of Staff the further duty of assisting the Secretary of Defense in his exercise of direction over the unified commands, would require an expansion of the Joint Staff and hence a lifting of the present statutory limit on its size. The President has directed the Secretary of Defense to add an operations division to the JCS organization. Both to speed and further unify the strategic planning process, he has also ordered the discontinuation of the system of joint committees, where representatives of the three Services reviewed the papers produced by Groups of the Joint Staff before their submission to the Joint Chiefs of Staff.

The President requested amendments to the National Security Act of 1947 that would authorize the Chairman to assign duties to the Joint Staff and, with the approval of the Secretary of Defense, to appoint its Director. He also asked for deletion of the discriminatory but largely meaningless stipulation that the Chairman should have no vote in the decisions of the Joint Chiefs of Staff. (The JCS do no "voting," as such, anyway.) Finally, provisions should be added to make clear that each military chief might delegate major portions of his Service responsibilities to his vice chief while devoting his own primary attention to JCS duties.

JCS Planning

The military-planning activities of the JCS are governed by a "Joint Program for Planning." This program provides for annual development or re-

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How the Joint Chiefs of Staff Organization Operates

vision of three basic guidance instruments—the Joint Long Range Strategic Estimate, the Joint Strategic Objectives Plan and the Joint Strategic Capabilities Plan.

Each Service Chief of Staff participates in developing these joint plans and, once approved by the JCS, each Service is responsible for developing its own plans in support of the joint guidance. Further, the JCS are completely informed of Service plans in support of joint plans, to insure that there is complete accord between all concerned as to the intent and objective of all military plans.

Concerning this setup, students of the JCS operation have said that within this arrangement lies the great strength and advantage of the Joint Chiefs of Staff system. With the exception of the Chairman, each member of the Joint Chiefs of Staff is the military head of his Service. As such he is in constant touch with the capabilities and limitations of his Service—i.e., with the day-to-day realities of the situation. Of greater importance, however, his efforts in developing joint

guidance are made with the full knowledge that he is responsible for his Service's role in carrying out the joint guidance. This union of joint authority and Service implementing responsibility is an indispensable element in the decision-making process. Responsibility for implementing decisions should not be separated from responsibility for making those decisions.

The purpose, scope and timing of the three basic joint guidance instruments are:

a. Joint Long-range Strategic Estimate

(1) Purpose:

(a) Provides a broad background strategic appraisal which will assist in the development of military policies, plans and programs.

(b) Provides assistance in the review of existing and proposed national security objectives and policies.

(2) Scope:

(a) Appraises, in broad terms, world situations affecting U.S. security that may exist or develop during the period of the estimate, including possible national and bloc alignments.

(b) Considers the factors and trends which may influence these nations or alignments to undertake military, economic, political or psychological courses of action which could affect the U.S. security and well being.

(c) Considers the type and nature of these courses of action, probable geographic areas of international conflict and the weapons and techniques likely to be employed.

(d) Appraises possible U.S. courses of action to counter potential developments in the world situations which could adversely affect U.S. security and well being.

(e) Develops the strategic concepts and considers the military posture required to support the most probable U.S. long-range national policies to accomplish the basic national objectives of the United States.

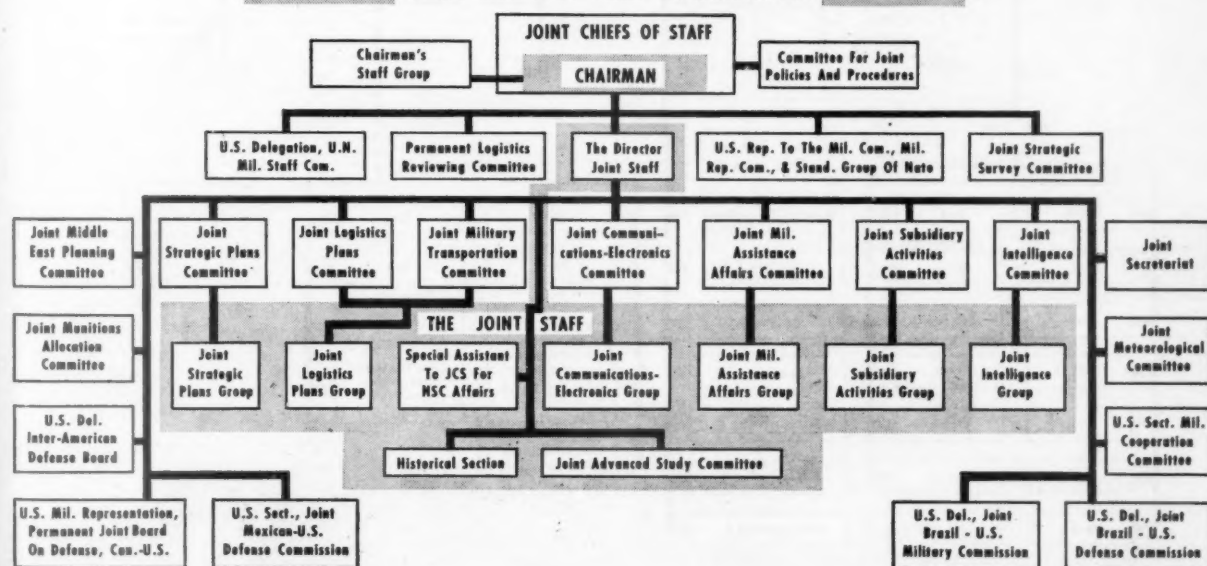
(3) *Timing:* The estimate covers a period of 4 years, beginning on 1 January, approximately eight years after its approval and dissemination.

b. Joint Strategic Objectives Plan

(1) Purpose:

(a) Translates national objectives

JOINT CHIEFS OF STAFF ORGANIZATION



and policies into terms of military objectives, strategy and basic undertakings which are attainable during the mid-range period.

(b) Provides guidance for cold war or military conflict short of general war, and for general war.

(c) Provides guidance for the determination, disposition, employment and support of U.S. military forces considered necessary to support the U.S. military strategy delineated for the period covered by the plan.

(d) Provides guidance for Service mid-range planning in sufficient detail to:

1. Determine the scope of logistical effort required by each Service.

2. Provide a basis for the computation of phased mobilization material requirements.

(e) Provides one of the bases for:

1. The annual statement by the Joint Chiefs of Staff to the Secretary of Defense for his consideration in developing his annual budgetary guidelines for a fiscal year beginning two years subsequent to the scheduled date of approval of the plan.

2. The preparation and justification of the annual budget requests

of each of the Services for the same fiscal year as above.

(f) Provides assistance in the establishment of a U.S. military position with respect to:

1. Military assistance to Allies.

2. The development and review of NATO and other mid-range plans.

(2) Scope:

(a) Determine the U.S. forces, the supporting military establishment, and the U.S. mobilization base required to be on hand on M-day to permit implementation of the plan in the event of a general war. (Forces must be of such magnitude and so balanced on M-day to support national policies under conditions of cold war or military conflict short of general war.)

(b) Determines post D-day U.S. military forces, and provides guidance on the mobilization base required.

(c) Estimates the Allied military forces required to support U.S. military strategy under conditions of cold war, military conflict short of general war and general war.

(3) Timing: For any type of a war, this plan assumes an M-date of 1 July, four years subsequent to the scheduled date of approval of the plan

by the JCS. For mobilization requirements planning purposes, the plan projects forces tabulations through a 6-month period after M-day.

c. Joint Strategic Capabilities Plan

(1) Purpose:

(a) Translates national objectives and policies into terms of military objectives, military strategy and basic military undertakings and tasks which are within actual capabilities.

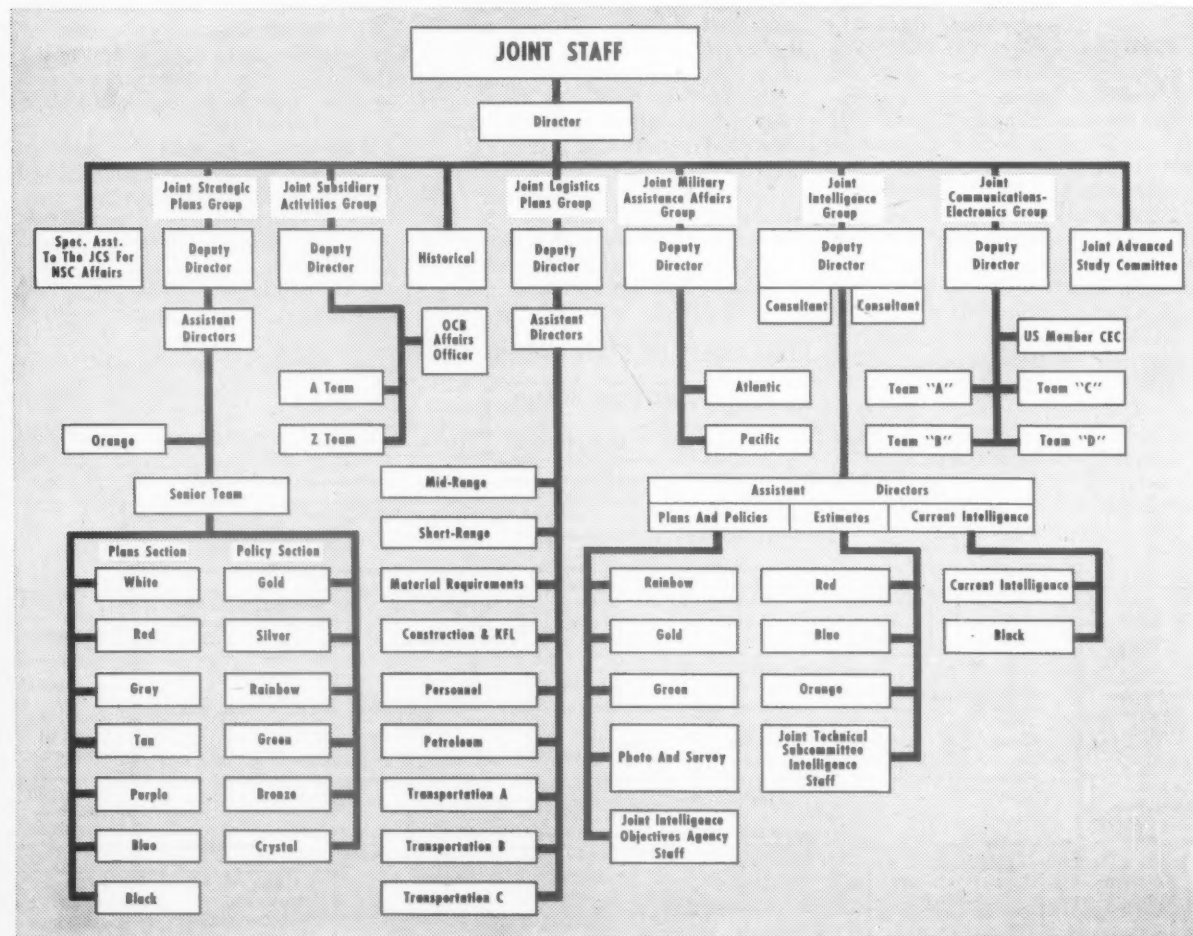
(b) Provides strategic and logistic planning guidance for the short-range period on the disposition, employment and support of U.S. military forces, and for support of appropriate Allied military force under conditions of cold war, military conflict short of general war and general war.

(c) Provides guidance with respect to military assistance to our Allies, and with respect to the development and review of NATO and other Allied short-range plans.

(2) Scope:

(a) Sets forth the location of available U.S. military forces to be employed in cold war or military conflict short of general war.

(b) Determines the deployment of U.S. military forces which are to be



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used on D-day of a general war.

(c) Determines the feasible post M-day U.S. military expansion required to pursue the most advantageous strategy in the event of a general war.

(d) Estimates those Allied (non-U.S.) military forces available and necessary to support the U.S. military strategy.

(3) *Timing:* For any type of a war, this plan assumes an M-day occurring any time during the fiscal year that the plan is in effect. For mobilization planning purposes to provide for that portion of the strategic concept where insufficient warning is obtained so as to permit mobilization prior to D-day, the plan extends the force tabulations for a 6-month period.

Review by the individual Services is an integral part of the system for attaining Joint Chiefs of Staff approval of these plans.

In addition to these basic planning jobs, the JCS are involved in a great deal of other guidance work. Here again the Services participate directly in this work. Examples include intelligence estimates and annexes, logistic plans (including transportation), mobilization policy, communications plans and military assistance proposals.

Other projects reach the JCS for consideration, coming in from many sources. For instance, every problem the National Security Council discusses is referred to JCS for comment. Others come from the Chiefs themselves, from the Service Secretaries, the Secretary of Defense, the President.

Each of the problems is referred to the team in the Joint Staff which has area responsibility. For instance, in the strategic plans' area, one of the teams in the Joint Strategic Plans group will be given a project and will come up with a plan or study. The Deputy Director of the JSP group then took the plan to the Joint Strategic Plans Committee (of which he is also chairman) for approval. It, like the other committees, was made up as a sort of lower-level JCS. If the committee reached unanimous agreement, the plan went into effect. (With one exception. If one of the Joint Chiefs asked that the plan be brought to them for review within seven days after the committee reached an agreement, the plan was not effective until the JCS signed off on it.) These committees took care of about 25% of the problems referred to the Joint Chiefs organization.

If one of these two conditions was not met, the problem is referred to the Deputy Chiefs of the Services with prime responsibility in the area concerned. (In Strategic Plans, it would be a committee of the Operations Deputies of the three Services.) As

Meaning of Latest JCS Change

On 7 June, Committees of the Joint Chiefs of Staff were abolished in accordance with the President's directive. Now a problem, which would have been routed formerly to one of these committees, will be handled by the Joint Staff Group which has been assigned the action. The group will prepare a coordinated Joint Staff paper and then circulate it to the services for comments. If the comments are acceptable to the Joint Staff, they will be incorporated into the paper. If there is unanimous concurrence in the Joint Staff action, such action will become a Joint Chiefs of Staff decision; unless a member of the Joint Chiefs of Staff, or the Director of the Joint Staff, requests consideration by the Joint Chiefs of Staff within seven days.

with the JCS themselves, the committees did no voting. If there was a disagreement, the committee presented split papers to the Deputies.

The Service Deputies meet on a regular schedule about two times a week to handle these problems. If they reach unanimous agreement, the plan goes into effect. If not, the problem is bucked to the JCS. (This second level takes care of about 50% of the JCS organization actions. Only about 25% of the problems referred to the JCS organization ever reach the top level.)

Those problems which the Deputies do not settle are then considered by the JCS, who make such changes as they desire and forward their recommendations to the Secretary of Defense. If they differ, the split papers are forwarded to the Defense Secretary for resolution. (However, contrary to all the press talk, the Joint Chiefs actually differ very little. In over 1000 problems which they have considered since January 1957, the JCS have been unable to come up with a unanimous agreement only three times.)

It is significant that the JCS have encountered relatively little difficulty in evolving strategic concepts upon which their plans are based. Their principal problem in this area of concern has been the funding of forces deemed necessary to implement the concepts—i.e., in determining the division of resources under circumstances in which the honest convictions of each Chief as to the forces required by his Service result in force totals which exceed the available resources.

Military people at the top echelon have often said, in essence, "Each one of us, regardless of occupation, becomes conditioned through experience to believe that certain ways of doing things are better than others. We see daily evidences of differences of views among equally competent persons as expressed in Supreme Court decisions, Congressional votes and in newspaper columns. We have the advocates in football of the T-formation and the single or double wing. Some fishermen

like to use wet flies, others prefer dry flies. So it is among the Joint Chiefs of Staff. And so it is, we believe, that from thorough exploration of differing views comes the best professional military advice which can be provided to the President."

To quote JCS Chairman General Twining, "Strategic planning cannot be an exact science. We have to evaluate as best we can the objectives and capabilities of our potential enemies. We have to look into our crystal ball to determine what future weapons will be like and what changes in the international situation may occur. Many of these factors are not under our control and thus there is no way in which we can guarantee that our estimates will be precise."

Organization

The Joint Chiefs of Staff consist of the chairman, JCS, the Chiefs of Staff of the Army and Air Force and the Chief of Naval Operations. The commandant of the Marine Corps has co-equal status with regard to matters on which he has expressed the direct concern of the Marine Corps.

Chairman: Gen. Nathan F. Twining, USAF

Serves as presiding officer of the JCS, provides agenda for meetings of the JCS and assists them in prosecuting business promptly; participates fully in the activities of JCS; furnishes the Secretary of Defense progress reports on items of current interest; makes arrangements to relieve the JCS of matters of lesser importance; organizes and manages the Joint Staff and the subordinates structure of the Joint Chiefs of Staff.

Chairman's Staff Group: made up of one man from each service (two colonels and one captain); charged with procuring and preparing data and providing advance research of information for use of the Chairman, JCS.

Committee for Joint Policies and Procedures: consists of the Service operations deputies on a part-time basis; responsible for preliminary con-

siderations of papers on joint policies, doctrines and procedures; and for recommending action thereon to JCS.

U.S. Delegation, U.N. Mil. Staff Committee: keeps the JCS advised of strategic plans and political military developments of the military staff committee; promotes and supports policies and plans of the JCS in committee actions; and fulfills the commitments of the U.S. as defined in the U.N. charter.

Permanent Logistics Reviewing Committee: responsible for reviewing, when necessary, JCS papers containing logistic implications and submitting recommendations thereon to the JCS.

U.S. Rep. to the Military Committee, Mil. Representatives Committee & Standing Group of NATO: represents and is directly responsible to the JCS for NATO military matters under consideration by the standing group, military representatives committee, or the military committee.

Joint Strategic Survey Committee: Maj. Gen. T. S. Timberman, USA; Adm. P. E. Dudley, USN; Maj. Gen. R. E. Beebe, Jr., USAF.

Advises the JCS on matters of grand and military strategy, many of which have political implications affecting the military.

Joint Middle East Planning Com-

mittee: an agency of, and directly responsible to, the JCS for preparing and coordinating strategic plans for the defense of North Africa (exclusive of the area assigned USCINCEUR) and the Middle East.

Joint Munitions Allocation Committee: charged with performing for the JCS duties relating to the allocation of finished munitions.

U.S. Del. Inter-American Defense Board: Studies and recommends to the governments of the American Republics measures necessary for closer military collaboration in preparation for the collective self-defense of the American Continent against aggression.

U.S. Mil. Rep., Permanent Joint Board on Defense, Canada-U.S.: makes studies relating to sea, land and air problems, including personnel and material, and to consider in the broad sense the defense of the northern half of the Western hemisphere.

U.S. Sect., Joint Mexican-U.S. Defense Commission: studies problems relating to the common defense of the U.S. and Mexico, considering broad plans for the defense of Mexico and adjacent areas of the U.S., and proposing to the respective governments the cooperative measures which, in its opinion, would be adopted.

Joint Secretariat: charged with the

performance of secretarial and such other duties as may be prescribed by the Director of the Joint Staff; performs administrative services for the JCS organization; establishes procedures for processing JCS business within the JCS subordinate offices.

Joint Meteorological Committee: responsible to the JCS for coordinating basic methods and procedures, operations, allocation of equipment to meet operational needs, and all other meteorological matters of joint application, except research, development.

U.S. Sect., Military Cooperation Committee: prepares and revises recommendations for implementation of the basic security plan for the North American continent.

U.S. Del. Joint Brazil-U.S. Defense Commission: responsible to the JCS for assisting the joint Brazil-U.S. military commission in specific matters of training, studies, liaison, procurement.

U.S. Del., Joint Brazil-U.S. Military Commission: makes recommendations on matters affecting mutual defense and other matters of military collaboration between the two countries and advising and assisting Brazilian Armed Forces to adopt U.S. equipment, organization, training, tactical and administrative methods and doctrines.

The following series of committees was located just one layer above the Joint Staff (see organization chart). In each case, the committee was made up of representatives from each of the services and was chaired by the deputy director of the Joint Staff group which reports to it.

Joint Strategic Plans Committee: charged with the preparation of joint studies and plans on current and future strategy and related military policy, the coordination of strategic plans of the Armed Forces and with the formulation of policies for joint training and education.

Joint Logistics Plans Committee: charged with the preparation of recommendations of the JCS on such logistic matters and major material requirements and personnel qualifications and requirements as are the responsibility of the JCS.

Joint Military Transportation Committee: charged with the preparation of recommendations to the JCS on matters relating to transportation, and with the coordination and control of policies, doctrine and procedures for all types of transportation to the extent that such functions are within the purview of the services.

Joint Communications-Electronics Committee: charged with cognizance of communications-electronics insofar as they pertain to matters for which the JCS are responsible.

Joint Mil. Assistance Affairs Com-



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mittee: charged with the preparation of joint studies and policies on current and future military assistance affairs.

Joint Subsidiary Activities Committee: charged with preparation and review of certain classified joint strategic plans and studies in support of current and future strategy and military policy.

Joint Intelligence Committee: charged with formulation of joint intelligence and the performance of such tasks and functions as assigned by the JCS.

The Joint Staff

Director: Lt. Gen. O. S. Picher, USAF

His immediate staff assistants are members of the several services. As principal agent of the Chairman, JCS, the Director of the Joint Staff has the responsibility and authority for supervising, coordinating and administering the work of the entire organization which supports the JCS, except for the Joint Strategic Survey Committee, the U.N. Military Staff Committee and the U.S. representative to the Military Committee, Military Representatives Committee, and the Standing Group of NATO.

For a breakdown of the Joint Staff organization, see the accompanying chart. Major groups are:

Joint Strategic Plans Group: Maj. Gen. Douglas V. Johnson, USA, Deputy Director.

Responsible for the preparation of joint plans and studies on current and future strategy and military policy as directed by the Director of the Joint Staff.

The Joint Strategic Plans Group is divided into two sections, Plans and Policy. Three of the Plans teams are charged with short-range, mid-range and long-range planning. The other four teams are divided on a geographical basis with the mission of monitoring the commands established by the JCS.

The Policy Section teams are divided on a functional basis, such as NATO, atomic energy and military assistance.

To assist the Deputy Director for Strategic Plans in supervising the work of his group and in reviewing material developed by the teams, a Senior Team and three Assistant Directors, one from each Military Department, are interposed between him and the sections.

Joint Logistics Plans Group: Maj. Gen. G. O. N. Lodoen, USA, Deputy Director.

Responsible for the preparation of joint logistics, joint transportation and personnel plans and studies as directed by the Director of the Joint Staff.

Joint Communications-Electronics Group: RAdm. W. D. Irvin, USN, Deputy Director.

Responsible for joint plans and studies for the direction and coordination by the JCS of the operational aspects of the communications-electronics activities of the services and with the performance of such other tasks as the Director, Joint Staff may prescribe.

Joint Military Assistance Affairs Group: RAdm. J. W. Cooper, USN, Deputy Director.

Responsible for preparation of joint policies, studies and reports on military assistance affairs as directed by the Director of the Joint Staff.

Joint Subsidiary Activities Group: Brig. Gen. C. A. Dolph, USA, Deputy Director

Responsible for the preparation of certain classified joint strategic plans as directed by the Director of the Joint Staff or by the Joint Subsidiary Activities Committee. Also responsible for liaison in certain classified matters between the organization of the JCS and other governmental departments and agencies.

Joint Intelligence Group: Brig. Gen. R. Collins, USA, Deputy Director

Responsible for staff support on intelligence matters to the Joint Intelligence Committee, the other agencies of the JCS and to the Office of the Secretary of Defense; performs other tasks as the Director, Joint Staff may

prescribe.

In each of the above groups, the assistant directors, immediate staff and/or teams and sections of the group are comprised of officers from each of the three services.

Special Assistant to JCS for National Security Council Affairs: RAdm. C. D. Triebel, USN

JCS advisor on the planning board of the National Security Council; provides a channel for furnishing military advice during formulation and review of national policies prior to consideration of these policies by the NSC itself.

Joint Advanced Study Committee:

Col. D. C. Hart, USMC
Col. J. S. Addington, USA
Capt. J. S. Gray, Jr., USN
Col. R. E. Kirtley, USAF

Studies the future of military aspects of national security in light of advancements of atomic age in science and technology, considering the effect of such concepts upon military art, and, based thereon, prepares studies and recommendations on military matters for use by planning agencies of the JCS and the services. Functions under the Director, Joint Staff.

Historical Section: Capt. W. E. Calder III, USN

Agency of the JCS for the accomplishment of all tasks of historical nature within their organization.



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Defense Training Importance Growing

The Air Materiel Command has asked the National Security Industrial Association's Training Advisory Committee for more help in solving problems of insufficient lead times and inadequate data in obtaining training devices for the Air Force.

Addressing a Training Advisory Committee meeting in Dayton, Ohio, L. R. Koepnik, member of AMC's directorate of procurement and production, said, "We desire to draw on this committee's background in an advisory relationship to our training equipment management group." In inviting TAC to the July 29-30 meeting of the training equipment management group, Koepnik said he hoped that "we can make accelerated progress on such problems as concurrent delivery of spare parts and manuals, configuration freeze point, minimum production lead time, and simplification of contractual documents."

In outlining management of the Training Devices Procurement Program, he pointed out that, "The major

portion of our Air Force peacetime operation is really a gigantic training program. It has been compounded by increasingly complex weapons and a terrifically high personnel turnover rate. In the near future we will have a new family of manned weapons which are so expensive to operate that we will not be able to afford 'Training by Doing.'"

Navy Using Electronic "Interview"

The Navy's Bureau of Personnel has installed an IBM 705 to provide the nearest thing to a personal interview with individuals prior to assignment.

Capable of handling data on 650,000 men and women of the Navy, the machine will be able to forecast training requirements, and will perform other detailed clerical and accounting functions. To allay any fears in the ranks about men now being interviewed by a machine, however, the Navy has announced that final decision on any action concerning a Navyman will still be made by men.

OWC Honors 10,000 Graduate

The Ordnance Weapons Command's Ordnance Management Engineering Training Agency at Rock Island (Ill.) Arsenal paused in its teaching mission in June long enough to honor its 10,000th graduate.

Honor went to Capt. Raymond W. Elder, deputy director of the surface-to-air missile division, Ordnance Guided Missile School, Redstone Arsenal, Ala. In presenting the certificate and commenting on the Agency's work,

Brig. Gen. W. K. Ghormley, OWC commanding general, said, "I and other managers in the corps would be remiss in our duties if we did not seek every available and established technique for improving our management functions."

The Agency, established in 1952, now teaches 22 courses, has a capacity of about 2500 students a year (although this year's demand for its training services reached 6,000).



Graduate Elder flanked by OWC's Ghormley, (left) and Brig. Gen. F. G. Waite, Asst. Chief of Ordnance for manpower, OCO, Washington, D.C.

CG's Medal To Hass

The first annual Commanding General's Medal for Technological Achievement at Ft. Belvoir, Va. (for the year's outstanding scientific accomplishment



From Telley to Hass

at the U.S. Army Engineer Research and Development Laboratories) went to Dr. Georg H. Hass, internationally known physicist in the field of optics and coatings.

Established by Maj. Gen. David H. Tulley, commanding general at Belvoir, the award is to be an incentive to encourage personnel to exert their best efforts "in attaining scientific or technological achievements." Dr. Paul D. Foote, assistant secretary of defense for research and engineering, spoke at the presentation, made by Tulley.

Among Hass' accomplishments has been the development of the final coating for the Vanguard satellites, which is applied at the Belvoir laboratories under his supervision.

Nuclear Trainers Using TV

The Army's first facility for training nuclear power plant operators, the Army Reactor at Ft. Belvoir, Va., is using closed circuit television to allow a classroom full of students to observe intricate maintenance functions or radioactive equipment operation in other parts of the plant.

Designed and built by the Dage Corp., for Alco Products, Inc., the Atomic Energy Commission's prime contractor on the Army Package Power Reactor, the TV monitor system includes a camera pick-up which can be located inside the plant's "Vapor Container," in which the reactor and radio-active, high pressure water system is located.

Shift in Key Personnel

ARMY

Maj. Gen. Emil Lenzner, Deputy Chief Signal Officer, to U.S. Army Electronic Proving Ground, Ft. Huachuca, Ariz., in July.

Maj. Gen. William M. Breckinridge, CG, Army Training Center (Infantry), Ft. Ord, Calif., to Eighth Army, Seoul, Korea, in October.

Brig. Gen. James P. Hannigan, G-4 of Hq Eighth Army and CG of Eighth Army Support Command, Seoul, Korea, to Hq Army Training Center (Field Artillery), Ft. Chaffee, Ark., in November.

Brig. Gen. Charles F. Tank, CG of Army Transportation Terminal Command, Pacific, Ft. Mason, Cal., to Eighth Army in October.

Maj. Gen. Archibald W. Stuart, CG of U.S. Army Hawaii and 25th Infantry Div., Schofield Barracks, Hawaii, to Holding Detachment, Office of Army Chief of Staff, Washington, in November.

Maj. Gen. Ned D. Moore, Director of Plans and Materiel in Office, DCS/Log, Washington, to U.S. Army Pacific, Ft. Shafter, Hawaii, in October.

Brig. Gen. William H. Harris from Adjutant General, SHAPE, to Office of Adjutant General, Washington, in September.

Brig. Gen. Elmer P. Hardenbergh from Comptroller, Hq U.S. European Command, Paris, to Army Council of Review Boards, Office, Secretary of the Army, Washington, in August.

Brig. Gen. Irvin L. Allen, senior advisor to the Second Republic of Korea Army, to Office, DCS/Log, Washington, in August.

NAVY

Vice Admiral William V. Davis, Jr., from Deputy Chief of Naval Operations (Air) to Deputy Commander in Chief, Atlantic Fleet and Chief of Staff and Aide, Commander in Chief, Atlantic Fleet.

Rear Adm. James W. Boundy from Director for Supply Management Policy, Office, Secretary of Defense, to Chief of Bureau of Supplies and Accounts.

Rear Adm. Frank A. Brandley, Chief of Staff and Aide, Commander of Chief, Pacific Fleet, to Commander, Carrier Div. 15 in December.

Rear Adm. Whitmore S. Butts, Commander, Carrier Div. 20 to DCS and DCS for Plans, Policy and Operations, Supreme Allied Commander, Atlantic, in September.

Rear Adm. Frank W. Fenno, Commander, Cruiser-Destroyer Force, Pacific Fleet to Commander, Naval Base, Guantanamo Bay, Cuba, in November.

Rear Adm. Reynold D. Hogle from DCS and DCS for Plans, Policy and Operations, Supreme Allied Commander, Atlantic, to Commander, Carrier Div. 18 in October.

Rear Adm. Frank O'Brien from Commander, Carrier Div. Three, to Chief of Staff and Aide, Commander in Chief, Pacific Fleet in November.

Rear Adm. Wellington T. Hines from Asst. Chief of Bureau of Aeronautics for Procurement to Deputy Chief and Assistant Chief of the Bureau in August.

Rear Admiral William A. Schoech from Deputy Chief and Asst. Chief of Bureau of Aeronautics to Commander, Carrier Div. Three about October.

MARINE CORPS

Brig. Gen. Donald M. Weller from Marine Corps Hq to Asst. Chief of Staff, G-1, at Hq, Marine Corps.

Brig. Gen. James P. Berkeley from Asst. Chief of Staff, G-1, at Hq, Marine Corps to CG, Department of Pacific, San Francisco, Cal.

AIR FORCE

Brig. Gen. Donald L. Hardy from Commander, Wright-Patterson AFB, to Air Materiel Command Inspector General, in July.

Brig. Gen. John D. Howe, Deputy Director of Maintenance Engineering, AMC, to CG, Wright-Patterson AFB, in July.

Brig. Gen. Lewis L. Mundell, Commander, Southern Air Materiel Area, Europe to Deputy Commander, San Antonio (Texas) AMA, in September.

General Frank F. Everest from cmdr. in chief, USAFE, to cmdr. 4th Allied Tactical Air Force.

Maj. Gen. Edward J. Timberlake from 1141st USAF Special Activities Sq, SHAPE, 4th Allied Tactical AF to Hq, USAFE, as vice cmdr. in chief.

Maj. Gen. Robert H. Terrill from director of operations, Hq, Strategic Air Command to Hq, USAF, Washington as AF member, Joint Strategic Survey Committee, JCS, in mid-July.

Maj. Gen. Wiley D. Ganey from asst. to cmdr., Air Training Command, Gulfport, Miss., to asst. to vice cmdr., ATC, Randolph AFB, Tex., in August.

JULY 1958

Dates to Circle

July 28-August 1

Course #10, Electronic Data Processing for Business and Industry—Hotel Biltmore, New York; sponsored by Canning, Sisson and Associates.

July 29-31

Third Annual Exhiborama and 2nd Annual Symposium, Society of Photographic Instrumentation Engineers—Statler Hotel, Los Angeles.

August 7-8

Annual Conference, Western Region of American Society for Quality Control—El Cortez Hotel, San Diego.

August 18-23

Seminar on Systems Engineering and Missiles Operations Research—Pennsylvania State University.

September 15-19

Instrument Society of America Automation Conference, Philadelphia, Pa.

September 30-October 2

Fourth Packaging and Handling Symposium—Washington, D.C.; organized by the Navy Department.

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Executive Control Meeting:

How It Works at AMC

by Joseph J. Varley

Deputy Chief, Management Analysis Division,
Comptroller, Headquarters, Air Materiel Command

IN THE six-year life of the Air Materiel Command (AMC) Executive Control Meetings, the surface aspects have changed very little, but the content has undergone considerable evolution. Some of the changes in content have been the natural result of experience. Other changes have represented deliberate attempts at synthesis, aimed at tying individual problems together and getting at the problems of the business as a whole.

Before going into the evolution of subject matter, it is important to have some understanding of the mechanics of the meetings. General E. W. Rawlings presides at the meetings, which he initiated in early 1952, not long after he assumed command of the AMC. For several years the meetings were held monthly, and later reduced to nine or ten each year. The conferees include the commanders of the Air Materiel Areas and AF Depots in the U.S., as well as the top executives at Hq AMC. The AMC units overseas are represented as often as possible.

The problems of approximately 30 subject areas are covered during each of the meetings, which last from five to six hours. The facts are presented graphically, usually in quantitative terms, by comparing actual performance with a schedule, a standard or a goal. After each problem is defined, the Commander leads the discussion of the causes, effects and the courses of action that could be taken to correct the deficiencies. He then gives instructions to the appropriate executive on steps to be taken. These "action items," which are the end products of the meeting, are recorded and published. The replies to the action items are also published, and a followup on the action taken becomes the first order of business at the next meeting.

The evaluation of deficient areas is the primary reason for a control meeting of this type. However, there is an important aspect of communication also. The senior managers have an opportunity to discuss the policies of the Command, as well as the major problems.

To the analysts who select the subjects for the meetings, the hardest question put by visitors has always

been "where do you get the problems?" The Management Analysis Division, which conducts the meetings, has access to the many financial and statistical reports, to the Inspector General's findings and to the results of staff visits. The selection of subjects from this mass of information is based on a combination of factors, the most important of which is an understanding of management's current aims. The key analysts absorb this understanding by attending each Executive Control Meeting and through other contacts with top management. The know-how thus obtained enables them to separate the important problems from the interesting history when analyzing the many facts contained in reports.

It was relatively easy to select subjects for the early meetings, in 1952 and 1953. A simple comparison of actual performance with standards or schedules brought out many individual operations which were in trouble. Each was presented at an Executive Control Meeting as an entity, and this served the purpose initially.

The next step was to choose subjects having obvious relationships and to present them together. For example, the cost of a function might be shown in conjunction with the production aspects of that function. This led to a search for the interrelationships between functions, since none operates in a vacuum. The synthesis began at this stage, because the relationships could not be shown easily with the facts at hand. Reports on separate functions are not always designed so that one function can be neatly matched with another.

Any large organization has many separate operations, and top management cannot review them all, even if it so desires. It becomes necessary to locate the key indicators of overall performance. For a commercial enterprise, the keys might be the return on investment plus the principal factors affecting both investment and return. It seemed to us that the return on AMC's investment was the degree of operational readiness of the Air Force units supported by the AMC. Specifically, the aircraft readiness indexes reported regularly by all AF wings are directly

related to the logistic support received.

Branching out from "return on investment" (aircraft readiness), we have selected several existing measures of AMC's contributions to readiness—in Supply, Maintenance and Procurement. For example, in Supply there are the AOCP (aircraft out of commission for parts) and ANFE (aircraft not fully equipped) rates, plus the fill rate on requisitions for material. Most of the other measures of performance tie into these key indicators. We attempt to show the related measures in logical sequence and only in the degree of detail necessary to define the problem.

We also use the AMC annual objectives as another means of getting at the heart of the matter. By checking on the progress being made toward the Commander's published list of objectives, we not only are sure that we are looking at vital operations, but are able to build interrelationships which might not be apparent on the surface. For example, a single objective can involve action in several different functions of the Air Materiel Command.

The weapon-system concept provides another foundation on which to build analyses for management. A weapon system is defined as composed of "equipment, skills and techniques, the composite of which forms an instrument of combat, usually, but not necessarily, having an air vehicle as its major operational element." At each Executive Control Meeting we present the current problems affecting logistic support of each of several air vehicles and their related equipment. This "vertical" slice requires a great deal more effort to prepare than does the functional look. It is worth the effort, however, because the problems can be tied to a very tangible end product—the aircraft.

The Executive Control Meeting of May 1958 was held in the same room as was the May 1952 meeting. Many of the charting and other techniques were the same. Probably the most noticeable difference was in the content, which undergoes change in order to keep up with the plans and objectives of the executives who use the meeting as the major control device of the Air Materiel Command.

ARMED FORCES MANAGEMENT

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Association Sets Up New Look, Picks Key Officials

ARMED Forces Management Association National Board of Directors approved, in late June, the "New Look" organizational plan illustrated on this page.

Purpose of the plan, says Board Chairman Rawlings Poole, is:

1. To provide the mechanism essential for optimum services to substantially increased numbers of members anticipated as a result of Secretary of Defense's indorsement of May 15, 1958. (Reported in June ARMED FORCES MANAGEMENT.)

2. To formalize a plan based upon all principles of organization which will contribute to efficient and economical attainment of the immediate and future goals of the Association.

3. To organize the National Headquarters of the Association in a manner which will provide a functional area for active individual and collective voluntary participation in all specialized fields of management and public administration.

The new plan provides for relatively small, homogeneous elements, permitting an expanded number of individual participants in the execution of National Headquarters functions and "providing more effective synthesis of all efforts toward common goals."

The plan provides for three distinct levels of activity:

1. The Policy Level—consisting of the National Board of Directors, the Executive Council, and the new Industry and Educational Institution Advisory Council.

2. The Programs Coordination Level—consisting of the Office of the President and five functional areas, namely Plans, Programs, Chapter Services, Publications, and National Conference. The primary duties of each functional area are generally conveyed by the titles of the Directorates indicated in the Chart.

3. The Execution Level—consisting of Chapters made up of the various categories of members and located at major U.S. Defense installations.

An organization chart, of course, is primarily only as good as the people who fill the boxes. Here is the roster of top Defense Department officials who have accepted key positions in the headquarters organization for the coming year:

Special Advisor to the President

b Murrey L. Royar, Vice Admiral, USN (Ret.)

Executive Vice President

b Robert W. Ward, Major General USA

Director, Management Analysis
Office of the Comptroller, Army

Vice Presidents:

Plans

b Howard K. Hyde
Director, Fiscal Management
Office of Asst. Sec. of Def. (Comptroller)

Programs

b Edward W. Clepton, Vice Admiral, USN
Chief, Naval Material

Chapter Services

b Thomas J. Gent, Jr., Brig. Gen. USAF
ODC/S Oper
Deputy Director, Manpower & Organization

Publications

b Edmund D. Dwyer
Chief, Navy Management Office

National Conference

b P. O. Hoffman, Colonel, USA
Commandant, Army Headquarters, Pentagon

Assistant Vice Presidents:

Plans

b I. M. Greenberg
Office Deputy Chief of Staff/Personnel
Department of the Army

Programs

Chester R. Allen, Brig. Gen., USMC
Hq., USMC
Assistant Quartermaster General

Chapter Services

Fred F. Vreeland, Colonel, USAF
Hdqs., D/AF
Office of Director of Management Analysis

Chairman, Editorial Board

b Harry I. Hadley

Department of the Army
Office of the Adjutant General

General Chairman, National Conference

b Carey A. Randall, Brig. Gen., USMC

Military Assistant to the Secretary of Defense

Director of Public Relations

Orville S. Split
Office of Asst. Sec. of Def. (Public Affairs)

Assistants to Executive Vice President

b C. W. Cecil, Brig. Gen., USAF
Director, Management Analysis, D/AF

Gus C. Lee

Director, Manpower Utilization
Office of Asst. Sec. of Def. (Manpower, Personnel & Reserve)

b Harold L. Corey, Colonel, USA
Office of the Inspector General
Department of the Army

Executive Secretary

Margaret E. Moore
Office of Industrial Relations
Department of the Navy

Treasurer & Chairman, Finance Committee

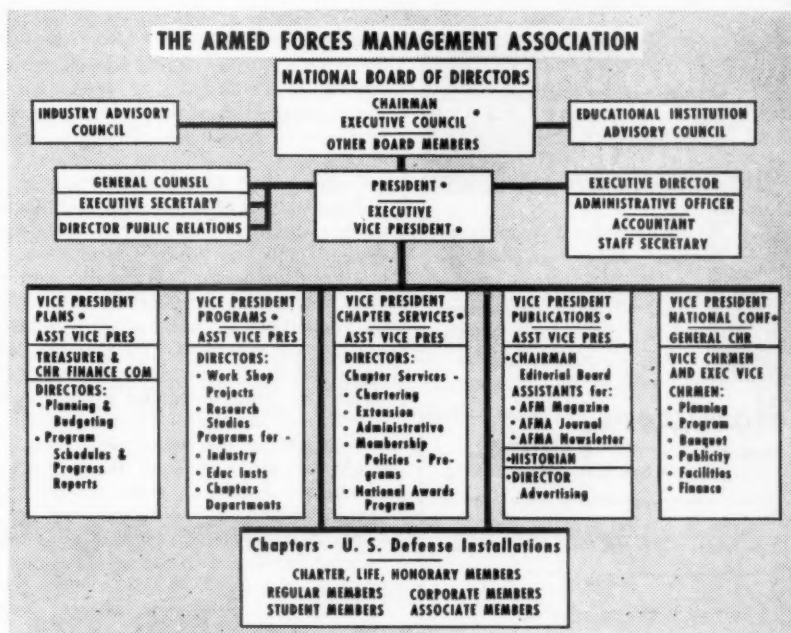
John Snyder

Office of Asst. Sec. of Def. (Properties & Installations)

b Member, Executive Council

b Member, Board of Directors

Poole has urged present or prospective AFMA members in the Washington, D.C. area who are interested in serving in any functional area to contact the vice president or his assistant in the area of interest.



Problems In Technical Publication Management*

Fourth in a Series

by Roswell Ward
Technical Publication
Management Consultant

Continued from June AFM

In addition to the development of accurate and detailed forecasting procedures as outlined last month, there are other phases of publication department activities which should be examined in order to determine how changing conditions can be met effectively.

1.—Defense contractors will very seldom enter into negotiations with the Armed Forces or with customers to whom they are providing components of military equipment, to obtain revision or simplification of the publication specifications. In the event that responsible and well-qualified opinion within the manufacturer's organization indicates that economies in cost or time or improvements in quality can be achieved by revision in publication specifications, such information and recommendations should be passed on to the responsible military or civilian executives concerned. Certainly the question of revision or simplification of specifications should not be regarded an "untouchable" subject.

2.—There may be any number of

refinements in working conditions for technical writers in a publication department which will increase productivity and decrease costs. Some specific data will be presented in an article in this series on the use of dictating machines by technical writers. This subject should be given more objective study than has been done in most cases. More study should be given to the development of the best office conditions for the technical writing and illustrating staff. The experience of big advertising agencies and other organizations who employ relatively large groups of writers and editors prove there are significant advantages in providing writers with private offices or with one or another type of "cubicle" in order to protect them from too much visual and noise distraction.

3.—Careful scrutiny should be made of methods for collecting every type of product information used in the preparation of instruction books or similar publications. The publication department should have top priority in obtaining the services of company photographers and blue-print and photostating services, as well as all other services related to the written or graphic transmission of product data. There should be a considered study of the production and further indoctrination, if necessary, in regard to obtaining the maximum amount of "information-giving" cooperation from research and development, design and production engineers. There should be constant and active liaison with service, field and sales engineers who are informed on tests or operating problems of equipment already in the field.

Also, if at all possible, there are definite advantages for the technical writers and illustrators not to have to depend only on blue prints, photographs, engineering reports and verbally transmitted information in writing operating manuals and overhaul and repair manuals. If possible a sample of the equipment written about should be brought to the publication department. If the equipment cannot be brought to the department, which might be the case with many types of military hardware, there should be some arrangement for unrestricted opportunity for writers and illustrators to become familiar with the actual equipment in the plant and if possible to have an opportunity to observe assembly or disassembly operations, and

to be present at various types of in-plant tests or tests in the field. There is undoubtedly a great deal of time loss and waste motion in many of the current practices in industry of forcing technical writers and illustrators to get their material only from documentary sources.


4.—In streamlining a publication department to deal with changing conditions, the publication manager and top management should take a long look at the quality of product photography which is available to them. Only an industrial photographer, with adequate training and experience, is able to produce photographs suitable for us in military instruction books and similar publications. In many cases improved photography can bring about significant savings in time and money expended for retouching as well as contributing greatly to the effectiveness of the publication.

5.—In a future article there will be a detailed discussion of the use of outside technical writing services. In some cases defense contractors have, in a time of reduction of contracts, come to depend entirely on technical writing services. In other cases defense contractors have a tendency to regard technical writing services as an expedient to be used only in the last resort if the publication department has reached demands which it cannot meet within a reasonable length of time. In adjusting to either situation it is quite possible to bring about substantial improvements in the evaluation and selection of technical writing services, as well as develop mutually satisfactory procedures which will greatly enhance the use of all aspects of the outside services.

It will be observed that there are a number of aspects of publication management which should be carefully scrutinized at all times, but especially at times when defense contracts may be decreasing in volume or may be greatly increasing. One possible organization expedient greatly affecting publication work either in a contracting or expanding situation, may be the unification of all company technical information services. This development has been adopted by a number of representative manufacturers but it can well stand further study.

In the next article the development of such unified technical information services will be discussed.

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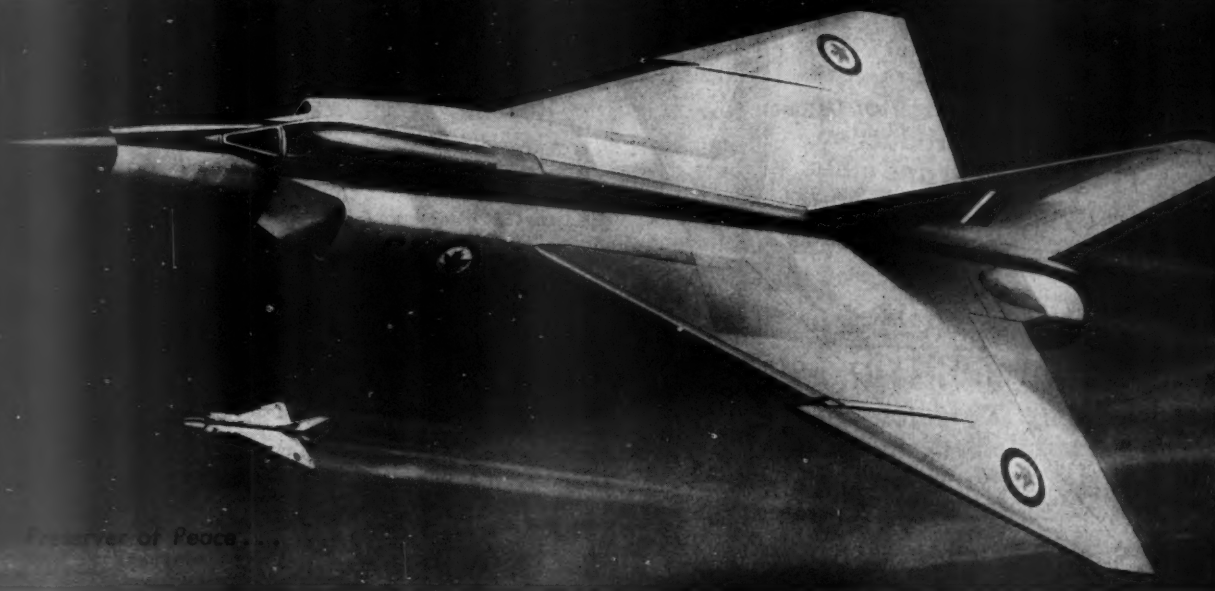
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ARMED FORCES MANAGEMENT

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control system. While an enemy plane is still beyond the range of human eye, this radar system will detect it, and provide the intercepting pilot with a continuous flow of information, electronically computed in terms of position, range and rate of closing. Associated with RCA in the project are the Minneapolis-Honeywell Regulator Company and several Canadian firms.



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CAMDEN, N. J.

JULY 1958

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In My Opinion

Bouquets

Many of the articles in your June 1958 issue seemed to be on timely subjects, especially well written, and effectively illustrated. Your "Departments" particularly seem to provide a wealth of diversified information which should pay dividends in terms of reader interest among our steadily growing circulation list.

Naturally, we were pleased to note the distinctive manner in which you reported some of the recent activities of our Association.

Rawlings S. Poole
National President
Armed Forces Management Association

New Idea For Air-Sea Rescue

We have noted that considerable interest in air-sea-rescue radio devices has been in evidence in many aviation periodicals. Comments have appeared both in the editorial material and in "letters to the editor."

Of particular interest to us has been the statements made with regard to the SARAH success and the intelligent query as to why it is not used in the United States.

Our experience in this area has indicated that air-sea-rescue radio beacons are not universally used in the United States. This is not the case however in other parts of the world. Most NATO countries use SARAH beacons for air-sea-rescue purposes; the United States does not. In those few instances that beacons are carried by American planes, no protection is afforded while flying over European, Canadian and other regions for the U.S. equipment is not compatible with SARAH receivers. The converse of this is also true where a SARAH beacon will not activate the American search receivers.

The SARAH beacon uses 1 vacuum tube, has over 20 hours life and approximate range of 100 miles. The American beacon contains 4 or more vacuum tubes, has short life and lower range capabilities. The cost difference is obvious.

Exercising our license rights with the British manufacturer of SARAH, we are currently developing a beacon called LOCAR which will function equally well on both sides of an international border with complete compatibility. This we feel will result in greater safety by cutting across preferences of various countries to different technical philosophies.

It may be of interest for you to know that many beacons of the SARAH type have been supplied for the recovery of missile nose cones. SARAH, because of its long range and high accuracy, has been selected over other systems to recover an expensive piece of hardware. We feel that it is a tragedy that flight personnel are not given the same opportunity for rapid and economical recovery.

Charles Urban
Simmonds Aerocessories, Inc.
Administrative Engineer

The Cape

May I offer my congratulations on your fine writing job on Cape Canaveral.

Edward Lerner

Each week this Office submits a list of magazine articles and/or books as recommended reading for Air Force Headquarters military and civilian personnel. This appears in the Headquarters USAF Information Bulletin.

The 12 June list carried the article, "Cape Canaveral—Doorstep to Space," from the May issue of your magazine. We thought the presentation in this article of busy Cape Canaveral was well written as well as educational.

Just thought you might like to know that we thoroughly enjoy your magazine and look forward to each issue.

Major Tim Dunn, USAF
Chief, Magazine and Book Branch
Office of Information Services

Lightweight Huts

In a recent issue you describe lightweight huts made of urethane foam bonded with aluminum surfaces. Who makes it?

J. D. Coulter

Hut is manufactured by Craig Systems, Inc. of Danvers, Mass. Urethane foam itself is being promoted by E. I. Dupont.—Ed.

Air Force Budget

I am enclosing a copy of our June issue of Contact which contains the article by Lt. Gen. M. J. Asensio reprinted from ARMED FORCES MANAGEMENT. Please accept my thanks as I believe it will have much reader interest among our students.

Ilo E. Young
Air Force Institute of Technology
Air University
Wright-Patterson AFB, Ohio

ARMED FORCES MANAGEMENT

Your Investment Future

WHY COMMON STOCKS

by W. Mac Stewart*

A recent letter from a new reader of this page—a Colonel in Germany—took us to task for apparently favoring common stocks for the small investor over fixed-return investments. He pointed out that the Serviceman, with not too much capital to invest, needs the security of a "guaranteed" return, such as from a savings and loan institution or government bonds.

Actually, as pointed out on this page, in April, 1957, there is no such thing as a "riskless" investment—including bonds. In any investment, the possible rewards must be weighed against the possible risk. About 500,000 people per year, most of them in the \$5,000-\$10,000 income group, are weighing these factors and becoming first-time buyers of common stock. Some buy individual issues, others invest in a group of stocks through mutual funds or other media. Let's examine the reasons for this increasing popularity of common stocks.

One of the major considerations in any investment is the income it will produce. And in these days of high income taxes, the only logical way to consider income is the net after taxes. So let's take the case of a married man with two children who earns \$7,500 per year. He invests \$1,000 in common stocks or a mutual fund that pays him \$30, to be conservative, before taxes. Another man in the same tax bracket puts \$1,000 in a "guaranteed" type of investment that pays him \$35 a year. Looking at income only, and disregarding the basic differences of these types of investments, which one of the two men had the highest income after taxes?

The man with the common-stock investment would have an after-taxes income of approximately \$6,653. The other man, although his gross income was \$5 higher, would have a net income of \$6,651—\$2 less. While the amounts shown in this example are small, it gives a clear illustration of the tax benefits of dividend-paying securities over interest-bearing securities. Current tax laws provide this advantage of dividend income over interest income. You may exclude from your gross income the first \$100 of dividends from corporate stocks received by you and your wife. You also have a credit against your total tax of 4% of the dividend income in excess of

that \$100 deduction. These credits do not apply to income from bonds, savings accounts, rents or other fixed-return investments.

Naturally, the higher the tax bracket of the taxpayer, and the larger the amount of income from dividends vs. interest, the larger the tax savings.

A major exception to this is the income from municipal bonds, which, in most cases, is free from Federal income tax. However, because of the low interest rate on such bonds, the investor must be in a high tax bracket to receive any substantial benefit. Also, these bonds are usually available only in \$1,000 denominations, which may put them out of reach of the average wage earner.

But income is only one factor in common-stock ownership. The greatest advantage is the opportunity for growth—generally nonexistent in fixed-return investments. For example, if you had invested \$550 in General Electric at its lows in the recession era of 1952-53, it would be worth about \$1,800 as of June 1st—also in a recession era. (\$550 invested in a fixed-return investment would still be worth \$550 today, but the purchasing power of those dollars would have decreased.)

If you sold your GE stock at \$1,800, the advantageous long-term capital gain tax rate would permit you to show a net profit of about \$930 after taxes, or an average net growth of better than \$150 per year. And you would have received, in addition, a substantial amount of dividends during the years.

The opportunity for long-term capital growth is the dominating factor in the sharp rise in popularity of common stock investments. As an example of that popularity, a recent survey of buying habits in our home city—covering a population of 750,000—revealed that 27% of families own securities other than government bonds. One-fifth of all families purchased securities in the past year, and 86% of the securities purchased were common stocks or mutual-fund shares. While this ownership percentage is much higher than the national average, it does illustrate the fast growing popularity of common stock investment by the average wage earner and Serviceman.

●During 1956, the Air Force spent 44.5 per cent of its maintenance-of-heavy-equipment money on civilian

contractors as compared with 14 per cent spent in the same manner in 1941.

●The use of oil dry instead of trisodium compound for cleaning hangar decks has resulted in savings of approximately \$21 quarterly at the Naval Air Station, Anacostia, D. C.

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Run Down of Key Contracts

ARMY

- \$4.1 million to Lear, Inc. for automatic pilots.
- \$1.6 to North American Aviation, Inc. for rocket engines.
- \$1.48 million to Gilfillan Bros., Inc. for replenishment spare parts for Corporal missile.
- \$1.1 million (total of seven contracts) to Western Electric Co., Inc. for Nike spare parts and components.
- \$5.3 million to Western Electric Corp. for Nike Hercules equipment.
- \$1.3 million to Radio Corporation of America in connection with Nike Zeus program.
- \$7.5 million to Lockheed Aircraft Corp. for production of XQ-5 drone target missile.
- \$2.6 million to Sylvania Electric Products, Inc. for "continuation of development work in electronics."

NAVY

- \$1.2 million to Stavid Engineering for production of Dynamic Test and Simulator Equipment for Radar Course Directing Centrals.
- \$839 thousand to Lavoie Laboratories for radio test sets.
- \$964 thousand to Consolidated Diesel Electric Corp. for power units and motor generators.
- \$685 thousand to M. Steinthal & Co. for parachutes.
- \$613 thousand to Northeastern Engineering, Inc. for frequency meters.
- \$13.8 million to Sperry Gyroscope Co. for production of modification kits to be applied to radar systems AN/SPG-49 to be installed in Talos-armed guided missile cruisers.
- \$6 million (total of two contracts) to Northern Ordnance, Inc. for Talos loader components and feeder system components and Terrier launching system repair parts.
- \$6.34 million to Raytheon Mfg. Co. for production of AN/SPG-51 radar sets and associated equipment.
- \$3 million to Sperry Gyroscope Co. to develop and produce all-attitude flight control systems for F8U-3, advanced all-weather fighter now under development by Chance Vought Aircraft, Inc.

AIR FORCE

- \$1.5 million to Temco Aircraft Corp. for F-100 pylon kits.
- \$17.4 million to Burroughs Corp. for construction of 24 coordinate data processing systems to be used in the SAGE system.
- \$3 million to Hughes Aircraft for a classified project. (Best guess: the missile that will go into the North American F-108.)
- \$2 million to Curtiss Wright for R3350-32W engines.
- \$5.2 million to Specialized Propulsion and Control Equipment Corp. for MB-3A-type aircraft maintenance docks.
- \$1.3 million to Frank G. Schenuit Rubber Co. for aircraft tires.
- \$1.3 million to Sundstrand Machine Tool Co. for constant feeder drives.
- \$1 million to Firestone Tire & Rubber Co. for B-47 and B-52 tires.
- \$10 million to Westinghouse Electric Corp. from Boeing Airplane Co. to develop and test an advanced ground control system to guide the Bomarc missile.
- \$4.6 million to General Electric Co. for production of flight controls for the F-105.
- \$51.6 million to Convair for spare parts and training parts for F-106A and F-106B.
- \$23 million to Boeing Airplane Co. for addition of items of work and increase in funds allotted for B-52G.
- \$2.2 million to Bendix Aviation Corp. for indicated airspeed-Mach number indicator for F-105 and F-106 aircraft.
- \$25.4 million to Northrop Aircraft, Inc. for prototypes and one static test YT-38 and T-38 supersonic jet trainers.
- \$15.9 million to Radioplane Div. of Northrop for development of XQ-4A target drone.
- \$1.3 million to Titeflex, Inc. for production of ignition harnesses and distributor blocks.

ARMED FORCES MANAGEMENT

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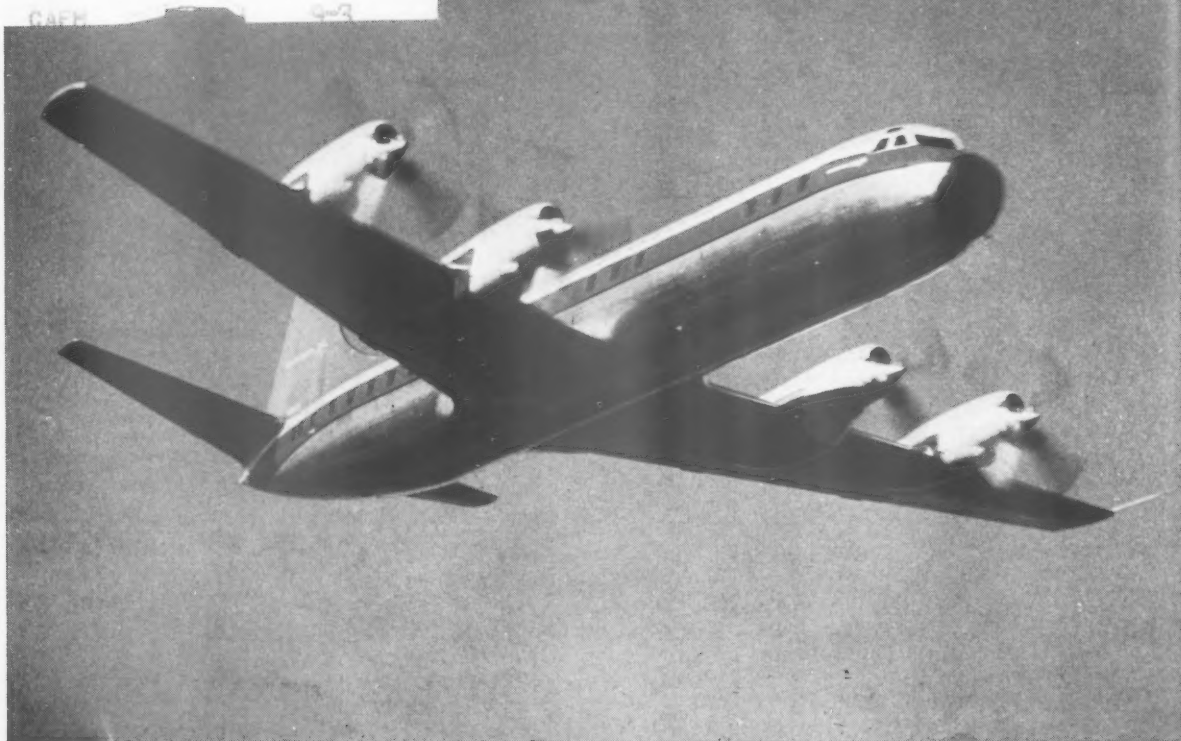
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